

EXHIBIT “F”

Christoph J. Flaherty, P.E.

IN THE UNITED STATES DISTRICT COURT
FOR THE EASTERN DISTRICT OF PENNSYLVANIA

ALLSTATE INSURANCE : NO. 2:19-CV-03529
COMPANY A/S/O THOMAS :
and LISA ELLIS, :

Plaintiffs, :

$$V_{\bullet}$$

LG ELECTRONICS USA, :
INC., :

Defendant. :

Thursday, January 7, 2021

Remote videoconference deposition
of CHRISTOPH J. FLAHERTY, P.E., taken
pursuant to notice at the location of the
witness in Severna Park, Maryland on the
above date, beginning at 10:25 a.m.,
before Jared E. Bittner, RPR, CSR (NJ).

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Christoph J. Flaherty, P.E.

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Christoph J. Flaherty, P.E.

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1 COURT REPORTER: All parties
2 to this deposition are appearing
3 remotely and have agreed to the
4 witness being sworn in remotely.
5 Due to the nature of remote
6 reporting, please pause briefly
7 before speaking to ensure all
8 parties are heard completely.

9 Counsel, please state your
10 appearance for the record.

11 MR. McGLYNN: Joseph McGlynn
12 for the plaintiff.

13 MR. VOTER: Warren Voter for
14 the defendant.

15 - - -

16 ... CHRISTOPH J. FLAHERTY,
17 P.E., having been duly
18 sworn/affirmed, was examined and
19 testified as follows:

20 - - -

21 EXAMINATION

22 - - -

23 BY MR. VOTER:

24 Q. Okay. Mr. Flaherty, you've

Christoph J. Flaherty, P.E.

1 been deposed before, correct?

2 A. Yes.

3 Q. And you know what the
4 procedure is and the rules, correct?

5 A. Yes.

6 Q. You don't need me to explain
7 them to you?

8 A. No, I don't think so.

9 Q. Okay. Let me first ask
10 whether you have made available your
11 entire file on this matter for today's
12 deposition.

13 A. I have.

14 Q. And is that file contained
15 within the link that Mr. McGlynn sent me,
16 do you know?

17 A. Yes, that should be the
18 entire file.

19 Q. Okay. Has anything been
20 removed from that file before today's
21 deposition?

22 A. No.

23 Q. Is there anything that's
24 been added to that file since you wrote

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1 your report in this matter on November
2 6th, 2020?

3 A. Yes.

4 Q. What's been added to the
5 file?

6 A. The expert reports from Mr.
7 Nemeth and Mr. Smith and their CVs.

8 Q. Did you issue any new
9 reports since the November 6, 2020,
10 report?

11 A. No.

12 Q. Have you created any new
13 documents or materials relating to this
14 case since your November 6, 2020, report?

15 A. No.

16 Q. Your hesitation makes me
17 wonder whether there is something you're
18 thinking about.

19 A. I was thinking about whether
20 a to-do list might qualify as a document
21 or material.

22 Q. Did you create a to-do list?

23 A. I created a to-do list for
24 things to review prior to today's

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1 deposition.

2 Q. Okay. Aside from the --
3 well, what was on the to-do list?

4 A. Oh, review my -- review
5 reports, meaning my own report, Buckley's
6 report and your expert's reports, let's
7 see, go back to review a couple of the
8 photographs, and some documents regarding
9 the timeline of installation of thermal
10 protection.

11 Q. Which photos did you remind
12 yourself to review?

13 A. Some from Dr. Ferrese's
14 scene photographs and my own evidence
15 exam photographs.

16 Q. Do these relate to some
17 particular subject?

18 MR. McGLYNN: Objection.

19 You mean the subject within the
20 group of the photos or --

21 MR. VOTER: Yeah.

22 BY MR. VOTER:

23 Q. I assume when you said you
24 added reviewing photos to your to-do

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1 list, the way you expressed it made me
2 think that you were reviewing specific
3 photos or photos that dealt with some
4 specific subject matter. Am I correct
5 about that?

6 A. Not more specific than the,
7 you know, routing of electrical wiring,
8 the presence of circuits, and the
9 condition of the refrigerator at the time
10 of the scene inspection.

11 Q. How many photographs would
12 you estimate were encompassed by the
13 subjects you just described?

14 A. I would say, well --

15 MR. McGLYNN: Objection.

16 THE WITNESS: Hundreds of
17 photographs encompass the subject.
18 I probably went through one to two
19 hundred just refreshing my memory.

20 BY MR. VOTER:

21 Q. Was that the only purpose in
22 doing it, to refresh your memory, or were
23 you looking for something specific?

24 MR. McGLYNN: Objection.

Christoph J. Flaherty, P.E.

1 THE WITNESS: The -- I was
2 doing it both to refresh my memory
3 and to look for any evidence of
4 the thermal protection.

5 BY MR. VOTER:

6 Q. Did you find evidence of the
7 thermal protection in the photographs you
8 reviewed?

9 A. I found evidence similar to
10 that presented in photographs in the
11 defense expert's reports.

12 Q. Photographs of a thermal
13 protector, correct?

14 A. The photographs that show
15 what is -- yes.

16 Q. So the answer was yes?

17 A. Yes.

18 Q. Okay. You mentioned
19 documents related to timeline of thermal
20 protection. I think I got the gist of
21 that if not the exact way you expressed
22 it. What documents did you review?

23 A. I reviewed in my file that
24 you have the confidential LG production,

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1 and they're Bates stamped. It looks like
2 30 pages Bates stamped between 648 and
3 678.

4 MR. McGLYNN: Can we just go
5 off the record for a second?

6 MR. VOTER: Sure.

7 MR. McGLYNN: Thanks.

8 (Discussion held off the
9 record.)

10 BY MR. VOTER:

11 Q. I said earlier, I forget if
12 we were on the record or not, but I have
13 received the file that Mr. McGlynn sent
14 me with 19 either folders or documents,
15 and each one is uniquely named. Do you
16 have that same array of folders and
17 contents in your file? Are you looking
18 at the same folders and document names?

19 A. Yes.

20 Q. Okay. Which one of these
21 has the Bates stamped document 648 to 678
22 that you referred to?

23 A. It's the document titled
24 "Light Overheating Issue."

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1 Q. Got it, okay. And can you
2 just take a look at it again just to
3 confirm that I'm looking at the same
4 thing you are?

5 A. I have it.

6 Q. Okay. So what I'm looking
7 at, the first page which is document 648,
8 it says "Exhibit A-Affected Models" and
9 it's a confidential -- there is a
10 confidential stamp, correct?

11 A. Yes.

12 Q. Okay. And then just to make
13 sure, the last page of that document --

14 A. Joe is -- I'm sorry. Joe
15 was waving, but I didn't hear him. I
16 don't know if he was trying to make an
17 objection and couldn't. I don't know
18 what.

19 MR. VOTER: Were you, Joe?

20 Joe, can you hear us? Can
21 you hear us?

22 (Recess; 10:35 a.m.)

23 (Resumed; 10:38 a.m.)

24 (The court reporter read

Christoph J. Flaherty, P.E.

1 back the preceding question and
2 answer.)

3 BY MR. VOTER:

4 Q. And the last page is titled
5 "Changed Parts" and it's document Bates
6 0678, correct?

7 A. Yes.

8 Q. And do you know what that
9 document is?

10 A. The -- the 31 pages
11 altogether?

12 Q. Yes.

13 A. Only by looking at it. It
14 hasn't been reported to me as -- so, I
15 mean, I can tell you what I think it is
16 based on my review of it I guess.

17 Q. Okay. Go ahead.

18 A. It looks like records of
19 internal testing and investigation
20 performed by LG regarding what we're
21 referring to as the light overheating
22 issue.

23 Q. Based on your earlier
24 answers, I assume you've had this

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1 document or collection of documents,
2 these 31 pages, in your file before you
3 wrote your report; is that correct?

4 A. Yes.

5 Q. Did you review it before you
6 wrote your report?

7 A. Yes.

8 MR. VOTER: Let me just make
9 a comment for the record. These
10 materials as I understand it were
11 generated by LG Korea. My client
12 is LG Electronics USA, Inc.

13 For ease of reference, I
14 will probably refer at times to LG
15 without necessarily specifying
16 which one I'm talking about, so if
17 we're talking about any work that
18 was done with regard to the light
19 bulb issue, I'm referring to LG
20 Korea in case I forget to add the
21 Korea to the end.

22 BY MR. VOTER:

23 Q. Okay. Let's go through the
24 rest of the file. So I have Buckley's

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1 report, correct?

2 A. Yes.

3 Q. And then the next document,
4 I've got five documents or folders to a
5 line, and is that how you're looking at
6 them or you're looking at them in some
7 different way?

8 A. No. I'm looking at just a
9 single list, top to bottom.

10 Q. Okay. So I'm going to read
11 you the titles of each and then you tell
12 me if you've got it and then what it is.

13 So the first one is
14 19-033R3Allstate0537Ellis.PDF. Actually
15 the word "insured" might be in there,
16 too. Is that Buckley's report?

17 A. Yes.

18 Q. Okay. The next one I have
19 says 1505 Report Final. What's that?

20 A. That is the Word document
21 version of my report which includes only
22 the text and no photographs.

23 Q. Okay. And then 1505 Report
24 Photographs, then it looks like Appendix

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1 A, Report Photographs, and it looks like
2 one is a Word doc and there is a second
3 one that's a PDF, correct?

4 A. Correct.

5 Q. Are they the same documents?

6 A. Yes.

7 Q. Or same photographs. And
8 these are what's attached to the report
9 that was provided to me?

10 A. Yes.

11 Q. Okay. And then we've got
12 "Additional Docs." That's a folder, and
13 what is in there?

14 A. These are some additional
15 documents that were provided to me it
16 looks like at the end of August.

17 Q. And who provided them?

18 A. Well, I got them from Mr.
19 McGlynn.

20 Q. Okay. Do you know what they
21 are?

22 A. They're -- some of them are
23 records from a previous case involving
24 the -- an allegation of LG refrigerator

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1 light overheating issues.

2 Q. Well, it looks like we're
3 going to need to go through these
4 individually then.

5 Okay. In the folder called
6 "Additional Docs," there are 14
7 documents. The first one says "Allstate
8 v. LG Confidential Document."

9 Do you see that?

10 A. Yes.

11 Q. What is that?

12 A. The -- this is a copy of the
13 service flash that involved replacement
14 of the main control circuit board in the
15 LG manufactured refrigerator.

16 Q. And next I have "Exhibit A
17 Selected Photographs." What's that?

18 A. I think these are selected
19 photographs from a different case,
20 previous fire involving an LG
21 refrigerator.

22 Q. And these were received from
23 Mr. McGlynn?

24 A. Yes.

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1 Q. What case is it?

2 A. I don't recall. I think
3 it's the case that this other -- this
4 other material relates to.

5 Q. Okay. What other materials
6 in the Additional Docs folder relate to
7 this other matter?

8 A. I think everything that's
9 listed as an exhibit, plus the -- not
10 that one. Okay. So everything, I think
11 everything in this file with the excep --
12 everything that's listed as an exhibit
13 plus the photographs, plus the document
14 that says "Rule 26 Report Final."

15 Q. Is it your understanding
16 that all of the materials in your
17 Additional Docs folder, aside from the
18 service flash that you identified, relate
19 to case name of Magee?

20 A. Well, not all of the
21 materials. I think there was -- there
22 are a couple of other exceptions there.
23 So all of the materials except for the
24 service flash which was the Allstate

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1 versus LG - Confidential Document, the
2 document titled "LGEUSellis0500 to 0647,"
3 and the document titled "Protective." So
4 those three items do not relate to Magee.

5 Q. Okay. Let's go through
6 these. So the first one we've already
7 talked about, that was the service flash,
8 right?

9 A. Yes.

10 Q. The second one, Exhibit A,
11 Selected Photographs, to your
12 understanding are these from Magee?

13 A. That is my understanding,
14 yes.

15 Q. Do you know what they are
16 photographs of?

17 A. Not other than just what
18 they visually depict.

19 Q. Okay. The top photograph
20 says Photograph No. 131, "Arc exam on
21 conductor found in refrigerator," agreed?

22 A. Yes.

23 Q. Do you know where in the
24 refrigerator it was found?

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1 A. No.

2 Q. The next photo, the
3 photograph below is Photo 6, "Severe fire
4 damage to refrigerator." Did you ever
5 actually see the refrigerator?

6 A. Not the one depicted in this
7 photograph.

8 Q. Did you see any photographs
9 from that refrigerator besides from these
10 three?

11 A. No.

12 Q. Did this Exhibit A inform
13 your opinion in this case?

14 A. Not specifically. The
15 whole -- I mean, everything in this file
16 informed my opinion to the -- in this
17 file, I mean, in this current directory
18 we're looking at, in the Magee file,
19 informed my opinion to the extent that
20 there had previously also been documented
21 issues with the internal illumination
22 light overheating. There is no specific
23 photograph here that figured into my
24 investigation other than that general

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1 point.

2 Q. Other than evidence that on
3 some previous occasion someone claimed a
4 light bulb stayed on and caused a fire in
5 an LG refrigerator, did any of the
6 materials from Magee inform your opinions
7 in this case in any way?

8 MR. McGLYNN: Objection. I
9 mean --

10 MR. VOTER: Okay. You made
11 an objection, Joe.

12 MR. McGLYNN: Okay.

13 THE WITNESS: Not outside of
14 the general point.

15 BY MR. VOTER:

16 Q. Just that on some other
17 occasion somebody made a claim that a
18 light bulb stayed on and started a fire
19 in an LG refrigerator? That's it, right?

20 MR. McGLYNN: Objection.

21 BY MR. VOTER:

22 Q. You can answer.

23 A. That that should in my mind
24 be considered as a potential ignition

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1 source.

2 Q. Okay. Anything beyond that?

3 A. No.

4 Q. Did you ever examine the
5 refrigerator from the Magee case?

6 A. No.

7 Q. Do you know whether it
8 contained the same components and design
9 as the Ellis refrigerator?

10 A. No.

11 Q. So just to finish the
12 description, we've got Exhibit B. That's
13 Charles Fricke's CV, correct?

14 A. Yes.

15 Q. Do you know who Charles
16 Fricke is?

17 A. Yes. I think he pronounces
18 it Fricke.

19 Q. Okay. Have you met him?

20 A. Yes, but not in connection
21 with this matter.

22 Q. Have you had any discussions
23 with him pertaining to your involvement
24 in this case?

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1 A. I did have a discussion with
2 him, yes.

3 Q. When was that?

4 A. I don't recall. I think it
5 was this last summer.

6 Q. Before you wrote your
7 report?

8 A. Yes.

9 Q. What did you learn from him
10 in that conversation?

11 A. Nothing more than what was
12 indicated in his file, his involvement in
13 that case in which it was his opinion
14 that an overheated -- or a light bulb
15 that could stay illuminated because of
16 some failures in circuitry within the LG
17 refrigerator could overheat and cause a
18 fire.

19 Q. Did you make notes of that
20 conversation?

21 A. No.

22 Q. Did anything you learned in
23 that conversation inform your opinion in
24 this case?

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1 A. Just to the extent that the
2 light bulb should be considered as a
3 potential ignition source.

4 Q. Did you reference that
5 conversation in your report?

6 A. No. I believe the light
7 bulb, I mean, to my recollection I was
8 considering the light bulb as a potential
9 ignition source prior to that
10 conversation, so it wasn't that this
11 conversation provided the late impetus to
12 consider that.

13 Q. I don't know if I asked you
14 this, but did you make notes of that
15 conversation?

16 A. No.

17 Q. Is it your typical practice
18 not to make notes of a conversation you
19 have with an engineer with respect to
20 some case you're involved in?

21 MR. McGLYNN: Objection.

22 THE WITNESS: Yes. I
23 typically do not take notes.

24 BY MR. VOTER:

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1 Q. How long was your
2 conversation?

3 A. I don't remember.

4 Q. Can you give me an estimate?

5 A. I would estimate 20 to 30
6 minutes.

7 Q. What else did you discuss
8 during that 20 to 30 minutes?

9 A. That's it.

10 Q. Well, okay. Let me ask the
11 question in a better way. What did you
12 discuss in 20 to 30 minutes with Mr.
13 Fricke?

14 A. The -- what led, why he
15 considered it being the overheating of
16 the light bulb, and we discussed the
17 sticking relay and the physical repair or
18 the product or equipment replacement that
19 LG undertook to address the sticking
20 relay.

21 Q. Did he know about the
22 efforts undertaken by LG Korea to address
23 what you referred to as the sticking
24 relay issue?

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1 A. He did know and showed me
2 like some -- he did know about the
3 circuit board replacement and the relay
4 replacement and showed me some pictures
5 that indicated the difference between the
6 original installation versus the
7 replacement installation.

8 Q. Are those photos in your
9 file?

10 A. Yeah. I think they're in
11 that, they're the three photographs in
12 that one directory that we were just
13 discussing.

14 Q. So am I correct that those
15 are photos P1310012, 014 and 015?

16 A. Yes.

17 Q. And these came from Mr.
18 Fricke?

19 A. That's my understanding.
20 I'm not sure if he took them himself or
21 who took them, but yes.

22 Q. So tell me what you
23 understand 012 to be or to show?

24 A. 012 shows two samples of the

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1 main control circuit board of the LG
2 manufactured refrigerator, one which was
3 represented to me as the original
4 construction, and the second being the
5 one on the right as the replacement or
6 updated construction.

7 Q. And when you say original,
8 was it the original for the model
9 involved in this case?

10 A. Yes.

11 Q. Is that the same model as
12 involved in the Ellis case?

13 A. I don't recall specifically.

14 Q. Did you make any effort to
15 find out?

16 A. The control boards and
17 everything that I saw were sufficiently
18 similar to consider them to be
19 effectively the same, but I don't think I
20 dug down more deeply than that.

21 Q. So was the answer to my
22 question you did not attempt to determine
23 if it was the same model as involved in
24 Ellis?

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1 MR. McGLYNN: The model of
2 circuit board or the model of
3 refrigerator?

4 MR. VOTER: Model of
5 refrigerator.

6 THE WITNESS: That is
7 correct.

8 BY MR. VOTER:

9 Q. Did the refrigerator
10 involved in the Magee case have one or
11 the other of the two circuit boards shown
12 in Photo 012?

13 A. I don't know.

14 Q. What does Photo 014 show?

15 A. 014 looks like a close-up of
16 the left -- the relays located in the
17 bottom right-hand corner of the left
18 circuit board from 012.

19 Q. And the 015 photo is a
20 close-up of the other circuit board from
21 012, correct?

22 A. Yes.

23 Q. When we talk about relay,
24 can we agree that we're referring to a

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1 relay that is in the circuit for the
2 light bulb?

3 A. Yes.

4 Q. Okay. There were more than
5 one relay in the refrigerator, right?

6 A. Yes.

7 Q. Okay. But the one that
8 we're concerned with is the one that is
9 in the circuit for the light bulb that's
10 in the upper section of the refrigerator,
11 correct?

12 A. That's right.

13 Q. Okay. And am I correct that
14 you don't know what relay was in the
15 Magee refrigerator?

16 A. That's right.

17 Q. And you don't know what
18 circuit board was in the Magee
19 refrigerator?

20 A. That's right.

21 Q. Do you know why he sent you
22 those photos?

23 A. He was showing me the
24 difference between the two phases of the

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1 circuit board design with LG's addressing
2 of the light overheating issue.

3 Q. Did you ask him whether
4 there was a report from the defense in
5 that case?

6 A. No.

7 Q. Did you expect if he
8 prepared a report that there would have
9 been a defense report?

10 A. Yes.

11 Q. Is there a reason you didn't
12 ask for that?

13 A. The -- the -- again, because
14 the case only prompted me to or affirmed
15 that the consideration that I should
16 continue to consider the light
17 overheating as a potential ignition
18 source in the Ellis case in particular.
19 I wasn't interested in trying to do an
20 independent analysis of the Magee case.

21 Q. Did you discuss with him
22 what the defense response opinions from
23 the McGee case were?

24 A. I don't recall.

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1 Q. Did you have his Magee
2 report before you spoke to him?

3 A. I don't think so.

4 Q. Who did you receive his
5 report from?

6 A. That was included with all
7 of the other documents in that Additional
8 Docs folder from Mr. McGlynn.

9 Q. And it was received after
10 your conversation with Mr. Fricke?

11 A. Yes. I think those
12 documents were either received at that
13 time or after.

14 Q. Okay. Well, let me be clear
15 in my question. At the time you spoke
16 with Mr. Fricke, did you have any of the
17 Magee materials?

18 A. I know that I had not
19 reviewed any of the Magee materials prior
20 to speaking with Mr. Fricke.

21 Q. Whose idea was it for you to
22 speak to Fricke?

23 MR. McGLYNN: Objection.

24 BY MR. VOTER:

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1 Q. You can answer.

2 A. Mr. McGlynn's.

3 Q. Were you curious what the
4 defense expert or experts said in
5 response to Mr. Fricke's opinions?

6 MR. McGLYNN: Objection.

7 THE WITNESS: No. Again, I
8 considered this as more general
9 information and I wasn't really
10 interested in redoing the Magee
11 investigation.

12 BY MR. VOTER:

13 Q. Did you ask him how that
14 case turned out?

15 A. No.

16 Q. After you reviewed the
17 materials, did you reach out to Mr.
18 Fricke again?

19 A. No.

20 Q. Is it your understanding
21 that the circuit board on the right in
22 Photo 012 shows evidence of a change to
23 the circuit board that's related to the
24 light bulb issue?

Christoph J. Flaherty, P.E.

1 A. Yes, that's --

2 MR. McGLYNN: Objection.

3 THE WITNESS: Yes, that's my
4 understanding.

5 BY MR. VOTER:

6 Q. As it relates to the circuit
7 board, what is your understanding of the
8 change that was made?

9 A. The relay controlling the
10 interior illumination light was replaced
11 with a larger one.

12 Q. So can you -- do you know
13 from looking at 012, Photo 012, which
14 relay was changed to address the light
15 bulb issue?

16 A. It looks like it was the
17 middle. If we're looking at the left
18 circuit board, it would have been the
19 middle of the five black smaller relays.

20 MR. VOTER: I may make a
21 little bit of noise. I'm going to
22 try to print that. I'm going to
23 mark this as Flaherty-4, and I'll
24 just hold it up so you can look at

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1 it.

2 (Exhibit Flaherty-4 was
3 marked for identification.)

4 BY MR. VOTER:

5 Q. Can we agree that what I'm
6 going to mark as Flaherty-4 is the Photo
7 P1310012 that's in your file?

8 A. Yes.

9 Q. Okay. Is the relay that we
10 are discussing that was changed contained
11 or included within the array of relays at
12 the bottom right of each board?

13 A. Yes.

14 Q. Okay. And if I start with
15 the relay all the way -- how many relays
16 are in that array on each board?

17 A. I would say there are six in
18 that particular row in both cases,
19 starting with a visibly larger one on the
20 leftmost side which is approximately the
21 center of the board.

22 Q. So if we start with the
23 leftmost relay and work our way to the
24 right, can you tell me what position the

Christoph J. Flaherty, P.E.

1 changed relay occupies on the new board
2 or on the right-hand board?

3 A. We call the leftmost one
4 number one, and it would be two, three
5 four. It would be position four.

6 Q. Okay. Can we agree that the
7 position four relay on the left board is
8 black in color and smaller than the
9 position four relay on the right board
10 which is larger and blue in color?

11 A. Yes.

12 Q. All right. What's the
13 difference between the position four
14 relay on the left board versus the
15 position four relay on the right board?

16 A. It's larger, both in the
17 physical and electrical sense.

18 Q. Well, that's what I'd like
19 you to explain. Explain in the
20 electrical sense what the difference
21 between the two is.

22 A. The larger relay can
23 interrupt and switch higher amounts of
24 current or is described to be able to

Christoph J. Flaherty, P.E.

1 interrupt and switch higher amounts of
2 current, electrical current.

3 Q. Do you have an understanding
4 based on your review of materials in this
5 case what the rationale was for going to
6 a larger relay in the light bulb circuit?

7 A. Yes.

8 Q. What was the reason?

9 A. The LG investigation
10 determined that the smaller relay could
11 stick shut. So they exchanged it with a
12 larger one which would be less likely to
13 stick shut.

14 Q. When you say "stick," that
15 just means it wouldn't turn to an off
16 position or off state when it was
17 expected to, correct?

18 A. Correct.

19 Q. And that would result in the
20 light bulb staying on even though the
21 door was closed, correct?

22 A. Correct.

23 Q. Do you understand
24 electrically why the larger relay would

Christoph J. Flaherty, P.E.

1 not have that problem?

2 A. Well, it would be less
3 likely to have that problem. And the
4 reason for that would be in the design of
5 the relay, the contact surfaces are
6 likely larger which would dissipate the
7 electrical energy over a larger surface
8 area so as not to cause as much damage,
9 and the internal mechanism separating the
10 relay contacts is likely also larger by
11 which I mean it would exert more force to
12 separate the contacts when the relay
13 should be off.

14 Q. When you say less likely,
15 are you aware of any large relay on an LG
16 refrigerator that stuck and resulted in
17 the light bulb staying on when the
18 refrigerator doors were closed?

19 A. No.

20 Q. Did you do any testing of
21 the larger relay to determine how often
22 it would stick and result in a light bulb
23 staying on even though the doors of the
24 LG refrigerator were closed?

Christoph J. Flaherty, P.E.

1 A. No.

2 Q. Is that something that you
3 could have done as an electrical
4 engineer?

5 A. Not in any meaningful way to
6 represent the facts in this particular
7 case.

8 Q. Okay. Well, my question
9 dealt more with your experience and
10 training. Did you possess the experience
11 and training to do such a test?

12 MR. McGLYNN: Objection;
13 asked and answered.

14 BY MR. VOTER:

15 Q. You can answer the question.

16 A. Yes.

17 Q. You do?

18 A. Yes.

19 Q. Did you consider running
20 such a test?

21 A. No. Well, I did consider
22 it. I determined not to I guess is a
23 better answer.

24 Q. When did you consider that?

Christoph J. Flaherty, P.E.

1 A. When I had determined that
2 the Ellis refrigerator had the larger
3 relay.

4 Q. And was that before or after
5 you wrote your report?

6 A. Before.

7 Q. So can we agree that at the
8 time of the fire the Ellis refrigerator
9 had the larger relay --

10 A. Yes.

11 Q. -- for the light bulb
12 circuit, correct?

13 A. Yes.

14 Q. And so we're clear, that's
15 -- the larger relay was the replacement
16 for the smaller relay that was identified
17 as causing or allowing light bulbs to
18 stay on even though the doors were
19 closed, correct?

20 A. It was --

21 MR. McGLYNN: Objection.

22 Sorry, you can answer.

23 THE WITNESS: It was
24 identified by the LG investigation

Christoph J. Flaherty, P.E.

1 as possibly sticking, causing the
2 light to remain on.

3 BY MR. VOTER:

4 Q. And you saw the -- you read
5 the results of that root cause analysis
6 that's contained in the documents that
7 are marked 0648 to 0670, correct?

8 A. Yes.

9 Q. Did you have any reason to
10 disagree with their conclusion that in
11 some cases the small relay would stick
12 and allow the light bulb to stay on?

13 MR. McGLYNN: Objection.

14 THE WITNESS: No.

15 BY MR. VOTER:

16 Q. And I think you said you're
17 not aware of a single instance where the
18 large relay stuck resulting in the light
19 bulb staying on even though the doors
20 were closed, correct?

21 A. Correct.

22 Q. What kind of testing did you
23 consider?

24 A. We considered doing the, you

Christoph J. Flaherty, P.E.

1 know, relay cycling testing or I
2 considered that. I considered testing of
3 the thermal characteristics of wattages
4 of lamps installed in refrigerators in
5 terms of temperatures that they might
6 reach if they were left on.

7 Q. Anything else?

8 A. No.

9 Q. You majored in physics at
10 the Naval Academy, correct?

11 A. Correct.

12 Q. What is the mechanism that
13 results in a relay not opening when it's
14 supposed to? You talked about contacts.
15 Do the contacts stick together?

16 MR. McGLYNN: Objection.

17 THE WITNESS: Yes.

18 Typically the most common reason
19 for a relay failing to open is
20 that the contact surfaces become
21 damaged through the progressive
22 cycles and metals making up those
23 contact surfaces soften and melt
24 and eventually effectively weld

Christoph J. Flaherty, P.E.

1 themselves together.

2 BY MR. VOTER:

3 Q. You just said there is a
4 minute arc that goes on as they close and
5 as they separate, right?

6 A. Yes.

7 Q. And over time that can
8 affect the surfaces and affect the
9 conductivity between them, and then over
10 additional time in some cases that can
11 result in a welding together, correct?

12 MR. McGLYNN: Objection.

13 THE WITNESS: Yes.

14 BY MR. VOTER:

15 Q. And that's why even though
16 the circuit is telling the relay it's
17 time to open up because the door is
18 closed, the relay doesn't because the
19 contacts are welded together, right?

20 A. Yes.

21 Q. Did you make any effort to
22 determine if the relay on the Ellis
23 circuit board for the light bulb had
24 contacts that were open or closed?

Christoph J. Flaherty, P.E.

1 A. No.

2 Q. Is that something as an
3 electrical engineer you could have done?

4 A. Yes.

5 Q. Meaning you know how to do
6 that?

7 A. Yes.

8 Q. Did you choose not to?

9 A. The -- I did not consider it
10 at the time of the inspection.

11 Q. Did you at any time after
12 the inspection?

13 A. I did consider it at the
14 time after the inspection, yes.

15 Q. When?

16 A. When I began to consider the
17 light being on as a potential ignition
18 source.

19 Q. When did you start
20 considering that as a potential ignition
21 source?

22 A. That would have been in the
23 month or so after the evidence
24 examination.

Christoph J. Flaherty, P.E.

1 Q. Was it around the time that
2 you received the materials on the Magee
3 case from Mr. McGlynn?

4 A. The -- no. I think it was
5 before that.

6 Q. So did you come up with that
7 on your own or was there some other
8 source --

9 MR. McGLYNN: Objection.
10 Come on.

11 MR. VOTER: Basis?

12 MR. McGLYNN: Objection.
13 First of all, if you're asking for
14 what I talked to him about are
15 attorney-client privilege, I think
16 you know better than that, Warren,
17 and second, the form is
18 objectionable.

19 MR. VOTER: Okay. I'll
20 rephrase the question and I'll
21 make it clear.

22 BY MR. VOTER:

23 Q. I don't want to know
24 anything about communications you've had

Christoph J. Flaherty, P.E.

1 with Mr. McGlynn. Okay?

2 A. Got it.

3 MR. McGLYNN: It sounded
4 like when you say did you come up
5 with that on your own and you're
6 talking about a conversation with
7 Mr. McGlynn, that's exactly what
8 you were asking.

9 MR. VOTER: I didn't mention
10 anything about a conversation with
11 you.

12 MR. McGLYNN: Okay. Okay.
13 When Mr. McGlynn was sending the
14 documents, but the witness has
15 been advised that you don't get
16 into anything that we discussed.

17 Okay, C.J.?

18 THE WITNESS: Got it.

19 MR. VOTER: Agreed. We're
20 clear on that.

21 BY MR. VOTER:

22 Q. So let me ask the question
23 again. I'll make it simpler.

24 Did you come up with the

Christoph J. Flaherty, P.E.

1 idea as the light bulb as a potential
2 source of ignition on your own?

3 A. Yes, or it was the light
4 bulb or a connection, you know, resistive
5 connection issue. In terms of the relay
6 sticking, I had no knowledge that that
7 had been an issue, an identified issue in
8 certain LG refrigerators at the time that
9 I was beginning to consider the light
10 bulb as a potential ignition source, or
11 the light bulb circuit I should say,
12 because I was really just considering
13 just the light bulb. It was just that.

14 Q. I'll get into it in some
15 more detail later, but is it fair to say
16 that you've offered two alternative
17 opinions in this case about the cause of
18 the fire? One is the light bulb
19 overheating, and I'm just trying to give
20 a shorthand summary of it, I'm not trying
21 to give you all of the details. One is
22 the light bulb overheating and the other
23 is an arc on the wiring harness, fair?

24 MR. McGLYNN: Objection.

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1 THE WITNESS: Yes.

2 BY MR. VOTER:

3 Q. Okay. So we're only talking
4 about the light bulb overheating issue at
5 this point. So at some point -- well, we
6 know that when you wrote your report in
7 November of 2020, light bulb overheating
8 causing fire was one of your opinions.

9 My question is, when did you
10 make the determination that that was
11 going to be one of your two opinions?

12 MR. McGLYNN: Objection.

13 THE WITNESS: I'm not sure
14 there was a specific time. It
15 came out of a month's long process
16 of review and consideration of
17 various items.

18 BY MR. VOTER:

19 Q. Was it before or after you
20 reviewed the Magee materials?

21 A. I began considering a light
22 bulb or I should say the light bulb
23 circuit as a potential ignition source
24 before reviewing the Magee materials.

Christoph J. Flaherty, P.E.

1 Reviewing the Magee materials called more
2 specific attention to relays and their
3 performance and did lend some credence to
4 that as a general theory.

5 Q. So when did you reach your
6 conclusion about the light bulb? Was it
7 before or after reviewing the Magee
8 materials?

9 A. The conclusion would have
10 been reached during the preparation of my
11 report, so...

12 Q. And when was that? It's got
13 a November 6 date on it. When?

14 A. Late October, early
15 November.

16 Q. Okay. When did you consider
17 testing or otherwise examining the relay
18 in the Ellis refrigerator to see if it
19 was stuck?

20 A. The -- in the summer, so
21 let's see, that would have been after the
22 Magee. Yeah, so July or August, in the
23 summer.

24 Q. How would you have tested

Christoph J. Flaherty, P.E.

1 it?

2 A. It would have been a --

3 MR. McGLYNN: Objection.

4 THE WITNESS: --

5 conductivity check across the
6 relay terminals.

7 BY MR. VOTER:

8 Q. How long does that take?

9 A. Not very long?

10 Q. Minutes?

11 A. Yes.

12 Q. And you decided not to do
13 that, correct?

14 A. Correct.

15 Q. Why?

16 A. Because I didn't think -- at
17 that point I knew the larger relay had
18 been installed and the -- I considered it
19 unlikely that the relay itself had stuck
20 or was still stuck.

21 Q. Is it still your opinion
22 today that the light bulb could have been
23 a cause of this fire?

24 A. Yes, although based -- yes.

Christoph J. Flaherty, P.E.

1 Q. Let me back up. Are you
2 saying that you didn't need to -- you
3 didn't feel that there was any benefit in
4 testing the relay in the Ellis
5 refrigerator?

6 MR. McGLYNN: Objection.

7 MR. VOTER: Basis?

8 MR. McGLYNN:
9 Mischaracterization.

10 BY MR. VOTER:

11 Q. I'm not sure I understand
12 your answer why you chose not to do the
13 testing of the relay.

14 A. Because there were other
15 ways that the light bulb could have been
16 on and I did not think -- I considered it
17 at that point unlikely that the relay was
18 stuck based on the work that LG had done.

19 Q. Go back to the other
20 testing. You said that you considered
21 relay cycling testing. Would you
22 describe what that would accomplish?

23 A. Well, it would determine how
24 a -- well, for it to be meaningful, it

Christoph J. Flaherty, P.E.

1 would have to be done on many examples of
2 a particular relay. And if you had
3 enough data, it would determine how many
4 cycles and under what current levels the
5 relay would typically be expected to
6 last.

7 Q. Is that something you're
8 capable of doing?

9 A. Capable, yes. It would be a
10 very time consuming effort.

11 Q. You also talked about
12 testing that you considered to determine
13 the thermal characteristics of the lamp,
14 and as an example you gave the
15 temperatures it would reach if left on.

16 Do you recall that?

17 A. Yes.

18 Q. And what would the point of
19 that be?

20 A. Well, if we had any
21 expectation to accurately reproduce the
22 conditions in the Ellis's refrigerator,
23 the point would be to see how -- what
24 might be able to be ignited and how it

Christoph J. Flaherty, P.E.

1 might be able to be ignited by the light
2 bulb.

3 Q. Why would that be important?

4 A. Well, the challenge there is
5 that there are too many variables to
6 consider to try and get any kind of a --
7 anything that could be considered an
8 accurate or reproducible or relevant
9 result.

10 Q. So am I correct that you
11 considered doing testing that would have
12 told you whether the light bulb got hot
13 enough to ignite something, but chose not
14 to because there were too many variables;
15 is that correct?

16 MR. McGLYNN: Objection.

17 BY MR. VOTER:

18 Q. You can answer.

19 A. Correct. I couldn't -- I
20 did not feel that we could accurately
21 reproduce the conditions that might have
22 existed in the Ellis's refrigerator to
23 the degree of specificity necessary to
24 make that determination.

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1 Q. What were the variables that
2 made that difficult?

3 A. It would have been the age
4 of the refrigerator, the number of
5 heating cycles it had previously been
6 exposed to through the light being on and
7 off and maybe staying on under certain
8 circumstances. It would be the presence
9 or not of a light guard or lens over the
10 fixture. It would be the proximity of
11 food storage items or anything else that
12 would have been stored inside the
13 refrigerator, the nature and the
14 proximity of those things.

15 Q. Anything else?

16 A. I think that's about it.

17 Q. How does the location,
18 presence or location of food storage
19 items affect the temperature that the
20 light bulb could reach?

21 A. It would affect the
22 ventilation that the light bulb would be
23 subject to and it would also affect how
24 much -- depending on what kind of items

Christoph J. Flaherty, P.E.

1 they were and how close they were to the
2 light bulb, they may provide a kind of
3 thermal insulation. It would also
4 provide the first material ignited
5 depending on what it was.

6 Q. Do you know what was in the
7 refrigerator just before the fire?

8 A. Not specifically.

9 Q. Do you know any item that
10 was in the refrigerator at the time just
11 before the fire?

12 A. No, not specifically.

13 Q. I don't know what "not
14 specifically" means. My question is very
15 simple. Do you know any item that was in
16 the refrigerator just before the fire?

17 A. There was food in there.

18 Q. What was the food?

19 A. I don't know.

20 Q. What was it in?

21 A. I don't know.

22 Q. Was it in anything?

23 MR. McGLYNN: I'm sorry. I
24 couldn't hear the question.

Christoph J. Flaherty, P.E.

1 BY MR. VOTER:

2 Q. Was it in anything?

3 A. Most likely.

4 Q. No. My question is, was it
5 in anything, sir?

6 MR. McGLYNN: Was the food
7 in anything like a container?

8 MR. VOTER: Exactly. Let me
9 ask the question again.

10 BY MR. VOTER:

11 Q. What's the basis for you to
12 believe that there was food in the
13 refrigerator?

14 A. That it's a -- it's the
15 refrigerator in the kitchen of the
16 Ellis's, that during the evidence exam
17 there is a physical odor of spoiled food
18 items and insect infestation that is
19 commensurate with spoilage of food items.

20 Q. Would these food items have
21 been in the freezer portion of the
22 refrigerator?

23 A. They were in both.

24 Q. Okay. So you actually saw

Christoph J. Flaherty, P.E.

1 food items in the refrigerator portion of
2 this product?

3 A. I saw remains of food
4 containers, yes.

5 Q. Is that the same as seeing
6 food?

7 A. Well, they were pretty
8 badly --

9 MR. McGLYNN: Objection.

10 THE WITNESS: -- burned, so
11 I'm not sure if I recognized any
12 particular carbonized mass as food
13 versus container.

14 BY MR. VOTER:

15 Q. Do you know how many
16 containers if any were in the
17 refrigerator just before the fire?

18 A. No.

19 Q. Assuming there were any in
20 there, do you know where they were
21 located within the refrigerator?

22 A. No.

23 Q. Sorry?

24 A. No.

Christoph J. Flaherty, P.E.

1 Q. Assuming that there were any
2 in there, do you know what any of those
3 containers were made of?

4 A. No.

5 Q. Is it fair to say that one
6 of the reasons that you decided not to do
7 the thermal characteristics testing was
8 that you had no idea what if anything was
9 around the light bulb in the Ellis
10 refrigerator?

11 MR. McGLYNN: Objection.

12 THE WITNESS: That's right.

13 BY MR. VOTER:

14 Q. I'm sorry?

15 A. I said that's right.

16 I'm going to need to take a
17 bathroom break and a water refill break
18 pretty soon.

19 Q. Give me a few more minutes.
20 I think we'll be at a good place to stop.

21 You said that there were, I
22 think you said that there were other ways
23 that a light could stay on. I'm
24 paraphrasing, but is that what you said?

Christoph J. Flaherty, P.E.

1 A. Yes.

2 Q. And what other ways could
3 the Ellis refrigerator light stay on?

4 A. If there was a failure in
5 the relay control circuit or in the door
6 switch that caused it to be energized
7 when it shouldn't have been, meaning the
8 relay is receiving a control signal to
9 stay shut even though it should be off.

10 MR. VOTER: Can I hear the
11 answer back, please?

12 (The court reporter read
13 back the preceding answer.)

14 BY MR. VOTER:

15 Q. So am I correct that you're
16 not saying that either of those things
17 happened? You're just identifying those
18 as possibilities, correct?

19 A. Correct.

20 Q. Was there any evidence that
21 you became aware of that the Ellises
22 believed, suspected, knew, any of those,
23 that their light was staying on even
24 though the refrigerator doors were

Christoph J. Flaherty, P.E.

1 closed?

2 A. No.

3 Q. Did you conduct any tests to
4 determine whether either of those two
5 other ways that the light could have
6 stayed on actually happened in this case?

7 A. No.

8 Q. Did you do any research that
9 would have provided information to you
10 about whether a refrigerator with the
11 same design as the Ellis model has ever
12 had a problem like those two
13 possibilities that you identified?

14 MR. McGLYNN: Objection.

15 MR. VOTER: You can answer.

16 THE WITNESS: I did not find
17 instances of light staying on
18 separate from the identified
19 smaller relay sticking issue.

20 BY MR. VOTER:

21 Q. The relay that the Ellis
22 refrigerator did not, correct?

23 A. Correct.

24 MR. VOTER: Why don't we

Christoph J. Flaherty, P.E.

1 take that break.

2 THE WITNESS: Okay.

3 (Recess; 11:48 a.m.)

4 (Resumed; 12:01 p.m.)

5 BY MR. VOTER:

6 Q. Mr. Flaherty, let me go back
7 to your file materials, so if we can
8 knock those out.

9 Did you say that Exhibits A,
10 B, C, D, E, F and G all relate to the
11 Magee case?

12 A. Yes, I think I did say that.

13 MR. McGLYNN: Well, just
14 hold on a second. I mean, just
15 take the time and make sure. I'm
16 sorry for interrupting, but just
17 don't assume that we heard what
18 you said accurately. Okay?

19 BY MR. VOTER:

20 Q. Well, let's go through them
21 quickly. We've already talked about
22 Exhibit A. That was three photographs.
23 Exhibit B is Fricke's CV, correct?

24 A. Yes.

Christoph J. Flaherty, P.E.

1 Q. Exhibit C is Fricke's list
2 of testimony. Exhibit D is the Fee
3 Schedule. Exhibit E is Data and
4 Information Considered. This appears to
5 be from his report, correct?

6 A. Yes.

7 Q. And it's just a list. It's
8 not the actual data and/or information,
9 correct?

10 A. Right, correct.

11 Q. Exhibit F is something
12 called Sample Complaints. It looks like
13 it's -- I can't tell how many pages long.
14 Oh, Page 1 of 5, so it looks like it's
15 five pages long?

16 A. Yes.

17 Q. Is this from Magee also?

18 A. Yes.

19 Q. Did this document, Exhibit
20 F, play any role in your conclusions in
21 this case?

22 A. Not other than the continued
23 consideration of the light bulb as a
24 potential ignition source.

Christoph J. Flaherty, P.E.

1 Q. Well, let me be clear. Was
2 there anything that you considered
3 evidentiary about Exhibit F and used in
4 your analysis and conclusions in this
5 case?

6 A. Just provided background
7 information regarding the potential for
8 overheating due to the light bulb.

9 Q. Because of the relay issue,
10 right?

11 A. Well, it could be due to any
12 issue which would cause the light bulb to
13 stay on. The only identified one here is
14 the relay issue.

15 Q. Okay. And it would be a
16 fair statement that -- I haven't read
17 these in any detail, but would it be a
18 fair statement to say that you don't know
19 anything about the design and components
20 of the refrigerators that are subject of
21 the customer complaints reflected in
22 Exhibit F?

23 MR. McGLYNN: Objection.

24 THE WITNESS: That is

Christoph J. Flaherty, P.E.

1 correct.

2 BY MR. VOTER:

3 Q. Okay. Exhibit G, Printed
4 Circuit Board Revisions, did this
5 document play any role in the opinions
6 you're intending to offer in this case?

7 A. No.

8 Q. Okay. Then there is a
9 document that just says LGEUS, and I'm
10 not sure what that character is, but
11 Ellis 0500 to 0647, correct?

12 A. Correct.

13 Q. Can you tell me what the
14 first 0500 through 0633 is?

15 A. Well, the first page
16 identifies this as a report on household
17 refrigerator, LG Electronics, from 2004
18 by Underwriters Laboratories.

19 Q. Can you go to Document 0637?

20 A. Okay.

21 Q. It's a multipage document.
22 Did you review it?

23 A. I don't recall this
24 document.

Christoph J. Flaherty, P.E.

1 Q. You say you don't recall.
2 Does that mean you did not review it?

3 A. I don't remember.

4 Q. Do you have any recollection
5 of what that document pertains to? Just
6 if I can ask you right now, just if you
7 would, don't look at the -- don't scroll
8 through the document. I'll represent
9 that the first page of it indicates that
10 it's a letter from the Winston & Strawn
11 law firm dated November 26, 2008.

12 Do you have any recollection
13 of what is in that letter?

14 A. No.

15 Q. Do you have any explanation
16 for why if it's in your file? You have
17 no recollection?

18 A. No.

19 Q. Do you normally review
20 materials that are provided to you?

21 A. Yes. I think my only
22 explanation in this case would be that
23 it's at the end and attached to this UL
24 report, and I likely made the assumption

Christoph J. Flaherty, P.E.

1 that that entire file was the UL report
2 and didn't review every page of the UL
3 report.

4 Q. Do you see the several
5 pages, I think it's three, before the
6 Winston & Strawn letter?

7 A. I -- yes.

8 Q. Are those wire diagrams or
9 circuit diagrams?

10 A. Yes.

11 Q. Did you review those?

12 A. I reviewed wiring and
13 circuit diagrams. I don't recall if
14 this -- I do not -- I think they were
15 included in other production.

16 Q. Well, let's be clear. Did
17 you review the wiring diagrams that
18 are -- I'm having trouble picking up
19 the -- oh, there we go.

20 Did you review wiring
21 diagrams that, contained in the Ellis
22 0500 to 0647 collection of pages, and
23 these wiring diagrams are specifically
24 marked Ellis 0634, 0635 and 0636? Did

Christoph J. Flaherty, P.E.

1 you review those?

2 A. I don't remember.

3 Q. Are you familiar with the
4 device known as a thermal protector?

5 A. In general, yes.

6 Q. In the context of this case
7 and the issues of this case, do you know
8 what I mean when I refer to a thermal
9 protector?

10 A. Yes.

11 Q. Are you aware that at some
12 point in time the type of refrigerator
13 involved in this case came to have a
14 thermal protector in the light bulb
15 circuit?

16 A. Yes.

17 Q. How does a thermal protector
18 operate?

19 A. In general it has a
20 particular setpoint at which it will
21 interrupt the flow of electricity.
22 Depending on the type of thermal
23 protector it can be a -- we would refer
24 to it as a single-shot device which means

Christoph J. Flaherty, P.E.

1 it operates once and then renders the
2 circuit it's in inoperable until it's
3 replaced, or it could be a resettable
4 device where it would operate when it
5 gets too hot and then reset once it cools
6 down.

7 Q. You mentioned a setpoint.
8 Is that a temperature setpoint?

9 A. Yes.

10 Q. And is the idea that you use
11 a thermal protector that triggers opening
12 a circuit before the device it's
13 protecting reaches a temperature that
14 could cause a problem?

15 A. Yes, that would be the
16 intent.

17 Q. So in the light bulb circuit
18 for a refrigerator, given the problems
19 that were experienced in some of the
20 earlier models of refrigerator, you have
21 a thermal protector that's set at a
22 temperature that's lower than the
23 temperature at which the light bulb could
24 cause combustion; fair statement?

Christoph J. Flaherty, P.E.

1 A. You would have to make some
2 judgment call as to what that temperature
3 would be, but that would be the -- that
4 would be a consideration to certainly
5 make in order to choose a proper
6 setpoint.

7 Q. So if that was done and a
8 thermal protector was added to the light
9 circuit and the setpoint was appropriate
10 for the protection being sought, if the
11 refrigerator light stayed on for whatever
12 reason, sticking relay or some other
13 fault or something wrong with the switch
14 in the door, the thermal protector would
15 de-energize the circuit before the light
16 bulb got hot enough to ignite anything,
17 correct?

18 MR. McGLYNN: Objection.

19 THE WITNESS: If it's
20 properly selected in terms of
21 setpoint and properly installed
22 and is continuing to function
23 properly, then yes, that is
24 correct.

Christoph J. Flaherty, P.E.

1 BY MR. VOTER:

2 Q. Okay. Do you know what the
3 setpoint for the thermal protector that
4 was added to this line of refrigerators
5 was?

6 A. No, I don't.

7 Q. Do you know if it was single
8 shot or resettable?

9 A. No, I don't.

10 Q. Is it your opinion that the
11 thermal protector that was selected for
12 this line of refrigerators was
13 inappropriate in some way?

14 A. Not -- I can't eliminate
15 that possibility, but I do not have that
16 as an opinion.

17 Q. Well, as you sit here today,
18 you have no information that the thermal
19 protector that was added to the line of
20 refrigerators was improper or
21 inappropriate in any fashion; fair
22 statement?

23 A. Yes, that's right.

24 Q. For the interior light bulb

Christoph J. Flaherty, P.E.

1 to start a fire, it would have to get hot
2 enough to ignite something combustible
3 that was close enough to ignite, right?

4 A. Yes.

5 Q. And if the thermal protector
6 was properly selected, the light bulb
7 should never be able to reach that
8 temperature, because the thermal
9 protector would de-energize the circuit
10 before it got hot enough, correct?

11 A. Assuming that it's also
12 properly installed and its function
13 hasn't degraded in any way, yes.

14 Q. You said in your report on
15 Page 4, and I'll quote, "The Ellis's
16 refrigerator was manufactured without
17 thermal protection" and then, "and with
18 the original relay."

19 So let me focus on the first
20 part of that sentence, "the Ellis's
21 refrigerator was manufactured without
22 thermal protection." Is that correct?

23 A. No. That was a mistake on
24 my part.

Christoph J. Flaherty, P.E.

1 Q. And how did you discover
2 that you had made that mistake?

3 A. In reviewing defense
4 expert's report.

5 Q. Did the report that you're
6 referencing also include a photograph of
7 the thermal protector?

8 A. Yes. It included a
9 photograph of light bulb circuitry and
10 the thermal protector included in that.

11 Q. Do any of the documents you
12 were provided answer the question of
13 whether the Ellis refrigerator was
14 manufactured with a thermal protector?

15 MR. McGLYNN: Objection.

16 THE WITNESS: I went back
17 after reviewing defense expert's
18 report to attempt to figure out
19 the -- well, what happened is I
20 was confused about the timeline
21 and the date of manufacture of the
22 refrigerator. So the
23 documentation that I reviewed does
24 show the installation of thermal

Christoph J. Flaherty, P.E.

1 protection in refrigerators
2 manufactured in Korea just prior
3 to the date of manufacture of this
4 refrigerator, and I made a mistake
5 I think in either interpreting the
6 timeline or the date of
7 manufacture.

8 BY MR. VOTER:

9 Q. So we can agree that
10 notwithstanding what your report says,
11 this refrigerator was manufactured with a
12 thermal protector, agreed?

13 A. Yes.

14 Q. And did you also make a
15 mistake during your evidence exam in not
16 recognizing the thermal protector?

17 MR. McGLYNN: Objection.

18 THE WITNESS: The -- at the
19 time of my evidence exam, the
20 circuitry had been removed from
21 the refrigerator, and I did not
22 specifically note the thermal
23 protector during that evidence
24 exam either.

Christoph J. Flaherty, P.E.

1 BY MR. VOTER:

2 Q. Having seen the photograph
3 that was in Mr. Nemeth's report,
4 N-e-m-e-t-h, did you recall seeing it
5 even if you didn't identify or recognize
6 what it was?

7 A. I did not recall seeing it,
8 but I'm sure that it was there.

9 Q. Okay. As you sit here right
10 now, sir, do you have any evidence that
11 the light bulb in the Ellis refrigerator
12 experienced a condition where it stayed
13 on even though the doors were closed?

14 A. It is one of two, one of my
15 two potential identified ignition sources
16 in the top of that refrigerator. As I
17 spelled out, I wasn't able to determine
18 specifically whether it was an issue with
19 the light or an issue with the circuit
20 with the electrical arcing that caused
21 the particular fire at the Ellis
22 residence. It's my opinion that it was
23 one of those two.

24 Q. Well, in order for it to be

Christoph J. Flaherty, P.E.

1 the light bulb, there has to be -- there
2 has to be some problem where the light
3 bulb stays on even though the doors are
4 closed, right?

5 A. Yes.

6 MR. McGLYNN: Objection.

7 THE WITNESS: Or the doors
8 weren't entirely closed.

9 BY MR. VOTER:

10 Q. Is there any evidence that
11 the doors were not closed just before the
12 fire?

13 A. No.

14 Q. Is there any evidence that,
15 aside from what you identified as a
16 possibility or potential, I'm asking
17 about hard evidence, testimony,
18 documents, physical evidence, is there
19 any evidence that you're aware of as you
20 sit here right now that the light bulb in
21 the Ellis refrigerator would stay on even
22 though the doors were closed?

23 A. Nothing specifically
24 sufficient to allow me to determine that

Christoph J. Flaherty, P.E.

1 that is the sole fire cause.

2 Q. Is there any evidence that
3 it stayed on when the doors were closed?

4 MR. McGLYNN: Objection.

5 You can answer.

6 THE WITNESS: Both the
7 occurrence of the fire in the top
8 portion of the refrigerator and
9 the arcing on the circuit in the
10 top portion of the refrigerator
11 are evidence that the fire started
12 in the top portion of the
13 refrigerator leaving the light as
14 a potential ignition source.

15 BY MR. VOTER:

16 Q. Okay. I understand that.
17 You've said that. My question is, is
18 there any evidence that you're aware of
19 that when the Ellis refrigerator doors
20 were closed the light bulb stayed on?

21 A. There is nothing specific.
22 I can't say that it definitely was on. I
23 have no -- yeah.

24 Q. Do you have any evidence, -

Christoph J. Flaherty, P.E.

1 aside from speculation, do you have any
2 evidence that the thermal protector was
3 installed improperly?

4 MR. McGLYNN: Objection.

5 Would you like to rephrase that?

6 MR. VOTER: No. He can
7 answer the question.

8 MR. McGLYNN: Objection;
9 form, speculation, the
10 characterization.

11 MR. VOTER: No, I'm actually
12 asking him not to speculate.

13 BY MR. VOTER:

14 Q. You understand the
15 difference between speculation and
16 evidence, correct?

17 MR. McGLYNN: Objection.

18 THE WITNESS: I don't have
19 any positive indication to show
20 that the thermal protector was
21 installed improperly, although
22 based on the degree of damage,
23 that would remain a possibility.
24 I can't confirm that it was

Christoph J. Flaherty, P.E.

1 installed properly either.

2 BY MR. VOTER:

3 Q. Well, do you have any
4 evidence that it was installed improperly
5 ten years before this accident, before
6 this fire when the refrigerator was made?

7 A. No.

8 Q. Do you have any evidence
9 that it had degraded by the time the fire
10 occurred and that that played some role
11 in this fire?

12 A. No.

13 Q. How did the light bulb come
14 into contact with something combustible?

15 MR. McGLYNN: Objection;
16 foundation.

17 THE WITNESS: Something
18 by -- I don't know specifically,
19 but as I said in the report, food
20 storage in the refrigerator could
21 come into contact with it.

22 BY MR. VOTER:

23 Q. Okay. But you don't know
24 what storage containers were in the

Christoph J. Flaherty, P.E.

1 refrigerator, right?

2 A. That's right.

3 Q. You don't know what they
4 were made of if there were any in there,
5 right?

6 A. That's right.

7 Q. You don't know where they
8 were located in the refrigerator if they
9 were in there, correct?

10 MR. McGLYNN: Objection.

11 THE WITNESS: Which is why
12 we didn't attempt to do any
13 testing along those lines.

14 BY MR. VOTER:

15 Q. Well, more important, if
16 they're not close enough to the light
17 bulb to ignite, even if somehow the light
18 bulb gets hot enough, then that theory
19 doesn't work, correct?

20 MR. McGLYNN: Objection.

21 THE WITNESS: Yes. It
22 wasn't lying sufficiently close to
23 the light bulb to ignite.

24 BY MR. VOTER:

Christoph J. Flaherty, P.E.

1 Q. Okay. And you have no
2 evidence that that was the case, correct?

3 MR. McGLYNN: Objection.

4 THE WITNESS: No.

5 BY MR. VOTER:

6 Q. No, it's not correct, or
7 yes, it's correct?

8 A. No, I don't have any
9 evidence of specifically what might have
10 been close enough to the light bulb to.

11 Q. Okay. And you would need
12 that evidence in order to state to a
13 reasonable degree of engineering
14 certainty that the light bulb caused the
15 ignition, agreed?

16 MR. McGLYNN: Objection.

17 THE WITNESS: My opinion is
18 that it's one of the possible, one
19 of the two potential failures that
20 caused the fire, that I was not
21 able to within a reasonable degree
22 of engineering or scientific
23 certainty determine which one of
24 those two it was.

Christoph J. Flaherty, P.E.

1 BY MR. VOTER:

2 Q. Okay. That's not really my
3 question. My question is, are you
4 able -- if you don't know -- if you're
5 unable to say what combusted, what it was
6 made of and where it was located in
7 relation to the light bulb, would you
8 agree that you're not able within a
9 reasonable degree of engineering
10 certainty to say that the light bulb
11 caused the fire?

12 MR. McGLYNN: Objection.

13 BY MR. VOTER:

14 Q. Do you agree?

15 A. Yes.

16 Q. Go back to the service
17 flash. Do you have it?

18 A. Yes.

19 Q. Do you see on the first page
20 that there are, it looks like an Excel
21 spreadsheet towards the bottom that
22 identifies different model numbers and on
23 the right column PCV part numbers? Do
24 you see that?

Christoph J. Flaherty, P.E.

1 A. Yes.

2 Q. And would you agree that
3 there are several, it looks like six, six
4 different PCV part numbers?

5 A. Yes.

6 Q. Do you know which one was in
7 the Ellis refrigerator at the time of the
8 fire?

9 A. I would have to review. I
10 think I called it out in my report. I
11 don't remember it off the top of my head.

12 Q. Okay. So can we just make
13 this part of the deposition easy and
14 agree that even though it was made with
15 the smaller relay, that the Ellis
16 refrigerator had been retrofitted with a
17 circuit board that had the larger relay
18 in the light bulb circuit?

19 MR. McGLYNN: Yeah. I mean,
20 just a second before you answer,
21 we can agree that it's a larger
22 relay. I just object to the
23 larger relay, you know, pursuant
24 to whatever -- it had the larger.

Christoph J. Flaherty, P.E.

1 MR. VOTER: Okay. I
2 appreciate that, but I don't know
3 why the limitation, so let me go
4 through it.

5 BY MR. VOTER:

6 Q. So what do you know about
7 repairs made to the Ellis refrigerator
8 after it was purchased?

9 A. I knew that there was a
10 repair to the ice maker because the
11 Ellises were experiencing some issues
12 with that.

13 Q. Anything else?

14 A. And then that the service
15 flash maintenance was also performed on
16 the Ellis's refrigerator.

17 Q. Okay. And it would be fair
18 to say if the service flash service is
19 performed properly, a new circuit board
20 will be installed in place of the
21 original; is that correct?

22 A. Yes.

23 Q. Okay. And is it your
24 understanding that that is what occurred

Christoph J. Flaherty, P.E.

1 in the Ellis's refrigerator?

2 A. Yes.

3 Q. And do you know what the
4 date of that was?

5 MR. McGLYNN: The date of
6 the work?

7 MR. VOTER: Yes.

8 THE WITNESS: I have the
9 date of completion of the service
10 flash as February 28th, 2009.

11 BY MR. VOTER:

12 Q. And can we agree that as a
13 result of that service flash, a new
14 circuit board was installed in the
15 Ellis's refrigerator that had the larger
16 relay -- had a larger relay in the number
17 four spot indicating that it was for the
18 light bulb circuit?

19 A. Yes.

20 Q. And that would have been how
21 many years before the fire?

22 A. Let's see, 2009, so is that
23 maybe ten?

24 Q. After that service are you

Christoph J. Flaherty, P.E.

1 aware of any problems that the Ellises
2 reported regarding their refrigerator?

3 A. No.

4 Q. Do you recall me asking them
5 in their deposition if they had had any
6 problems?

7 A. Yes.

8 Q. And what was their answer?

9 A. They said they had not.

10 MR. VOTER: Okay. Let me go
11 back to your file materials.

12 Joe, I think maybe the
13 quickest way to do this if it's
14 okay with you is I'm going to
15 print the e-mail you sent me with
16 the Dropbox link in it, and I'm
17 going to mark it as an exhibit,
18 and then we'll know that
19 everything that you sent to me in
20 that link represents the contents
21 of Mr. Flaherty's file. Does that
22 sound like it would work?

23 MR. McGLYNN: Yes. We have,
24 just for the record, you both

Christoph J. Flaherty, P.E.

1 agree that you're looking at the
2 same contents, right? It sounded
3 like you went through that, right?

4 MR. VOTER: Yeah, I think we
5 already did that.

6 THE WITNESS: Yes.

7 MR. VOTER: So Flaherty-1
8 will be his November 6, 2020,
9 report. Flaherty-2 will be the
10 CV. Flaherty-3 will be his list
11 of testimonies.

12 Now, I'm going to mark the
13 e-mail from Joe McGlynn to me from
14 today at 10:19 a.m. which has a
15 Dropbox link in it, and that link
16 is to the entirety of Mr.
17 Flaherty's file, and that's going
18 to be 5, Flaherty-5. There is
19 something wrong with my printer,
20 so it's got that weird skid mark
21 on there.

22 (Exhibits Flaherty-1 through
23 Flaherty-3 and Exhibit Flaherty-5
24 were marked for identification.)

Christoph J. Flaherty, P.E.

1 BY MR. VOTER:

2 Q. Okay. Does your report
3 which is marked as Flaherty-1, does that
4 summarize the opinions that you intend to
5 offer in this case?

6 A. With the exception of the
7 change that we discussed regarding the
8 presence of a thermal protector, yes.

9 Q. Are there any opinions that
10 you intend to offer in this case that are
11 not included in this report other than
12 what you just referenced?

13 A. No.

14 Q. Did you look at Mr.
15 Ferrese's evidence exam photos at any
16 point in your involvement with this case?

17 A. Yes.

18 Q. Did his evidence exam photos
19 show the presence of the thermal
20 protector?

21 A. I don't recall. I don't --
22 I didn't go back to his evidence exam
23 photos to see if I could find it
24 specifically after I realized that one

Christoph J. Flaherty, P.E.

1 was installed.

2 Q. Do you know Mr. Ferrese?

3 A. Yes.

4 Q. What's his area of
5 expertise?

6 A. He's an electrical engineer.

7 Q. Did you replace Mr. Ferrese
8 in this matter?

9 A. I think so.

10 MR. McGLYNN: Objection.

11 BY MR. VOTER:

12 Q. Do you know why?

13 A. No, I don't.

14 Q. Did you know at the time
15 that you were retained that a lawsuit had
16 already been filed against my client by
17 Allstate alleging that the refrigerator
18 was defective?

19 A. No, I don't -- I don't think
20 I knew that. I don't know when the
21 lawsuit was filed.

22 Q. When did you begin receiving
23 materials about the lawsuit?

24 A. About the lawsuit, I mean, I

Christoph J. Flaherty, P.E.

1 received materials about the case.

2 Q. That's what I mean.

3 A. I'd have to look that up. I
4 think it was in January of 2020, but I'd
5 have to look at my correspondence to see
6 when I actually received those.

7 Q. Did the materials you
8 received include discovery responses from
9 my client?

10 A. Yes.

11 Q. And did those discovery
12 responses indicate the caption, what
13 lawyers call caption of the case?

14 A. Yes. Discovery responses
15 would indicate that a lawsuit had been
16 filed.

17 Q. By Allstate and against LG
18 Electronics US?

19 A. Yes.

20 Q. Is it fair to say that
21 before you did your evidence exam you
22 knew what Allstate's position was with
23 regard to the start of this fire?

24 MR. McGLYNN: Objection;

Christoph J. Flaherty, P.E.

1 foundation.

2 MR. VOTER: Well, okay.

3 BY MR. VOTER:

4 Q. Can we agree that before you
5 did your evidence exam you knew there was
6 a lawsuit brought by Allstate against LG
7 Electronics USA, agreed?

8 A. No. I don't think -- I
9 don't know if I appreciated that at the
10 time. I did receive materials. I don't
11 remember exactly when I received those
12 materials. And at the time of my
13 evidence exam, I did not know what either
14 Allstate's or Mr. Ferrese's position was
15 regarding any issues with the
16 refrigerator.

17 Q. At the time that you did
18 your evidence exam on February 5, 2020,
19 did you have any information in your file
20 that would indicate Allstate had sued LG
21 Electronics US?

22 A. I don't -- I don't remember.

23 Q. Okay.

24 A. At the time --

Christoph J. Flaherty, P.E.

1 Q. Go ahead.

2 A. I was just going to say, I
3 know at the time of the evidence exam, I
4 knew that Mr. Buckley, he had
5 communicated to me that his opinion was
6 that the fire started inside the
7 refrigerator.

8 Q. Did you ever speak to Mr.
9 Ferrese?

10 A. No. Well, yes, but not in
11 preparation for this case. I've run into
12 him in other matters.

13 MR. McGLYNN: Well, I mean,
14 you haven't talked to him about
15 this case, right? I mean, that's
16 just so we're clear.

17 THE WITNESS: Right.

18 BY MR. VOTER:

19 Q. Does your file include your
20 invoices?

21 A. No.

22 Q. Do you know how much you
23 have billed on this file?

24 A. I can look it up. I don't

Christoph J. Flaherty, P.E.

1 know off the top of my head. I guess I
2 would estimate between 5 and \$10,000.00,
3 but I don't know exactly.

4 Q. What's your hourly rate?

5 A. It's currently \$290.00 an
6 hour.

7 Q. So if I wanted to know the
8 number of hours you had devoted to the
9 case, I could just divide 5,000 or 10,000
10 by 290 and get something close?

11 A. Yes. I could also provide
12 the actual invoices. I just didn't --

13 MR. McGLYNN: Yeah. Well,
14 can you tell us? Is it easy
15 enough -- sorry, Warren. I'm
16 sorry for interrupting you.

17 Is it easy enough to tell us
18 how much you billed?

19 THE WITNESS: Yeah. Let me
20 look it up.

21 Okay. So it looks like I'm
22 behind on some of my billing here.
23 So I've billed, what would that
24 be, 9,700, so pretty close to

Christoph J. Flaherty, P.E.

1 \$10,000.00. And I should rephrase
2 that. I haven't billed that much.
3 That's how much I have worked
4 because the -- I haven't sent out
5 the most recent invoice which
6 includes probably about half of
7 those hours.

8 BY MR. VOTER:

9 Q. When were you hired in this
10 case?

11 A. In -- let's see. I think
12 that's -- I usually write that as the
13 first sentence in my report.

14 January 24th, 2020.

15 Q. Who hired you?

16 A. Mr. McGlynn or someone in
17 his office. I don't remember who
18 specifically the first contact was with.

19 Q. Have you worked with Mr.
20 McGlynn on other cases?

21 A. Yes.

22 Q. How many?

23 A. Five to ten.

24 Q. You worked with Mr.

Christoph J. Flaherty, P.E.

1 McGlynn's law firm on other occasions in
2 addition to or beyond the five to ten
3 with Mr. McGlynn?

4 A. Yes.

5 Q. How many would you say with
6 the de Luca Levine firm that aren't with
7 Mr. McGlynn?

8 A. In total over the years?

9 Q. Yes.

10 A. I would estimate 50. That
11 would be a ballpark.

12 Q. And have you worked with
13 Allstate -- have you worked for Allstate
14 before?

15 A. Yes.

16 Q. You know what, you probably
17 understood what I was driving at, but my
18 question might not have been as clear as
19 I thought. So instead of using the word
20 "before," let me just go back through
21 your answer.

22 Are you saying that you have
23 worked with Mr. McGlynn on other, on five
24 to ten other cases besides this one?

Christoph J. Flaherty, P.E.

1 A. Correct.

2 Q. And you've worked with his
3 law firm on roughly 50 matters other than
4 the five to ten you've worked with Mr.
5 McGlynn on, correct?

6 A. Yes.

7 Q. And have you worked on other
8 matters for Allstate besides this one?

9 A. Yes.

10 Q. How many?

11 A. I have no idea, but it's
12 quite a few.

13 Q. More than 50?

14 A. Yes.

15 Q. More than 100?

16 A. Over the years we're
17 talking?

18 Q. Yes.

19 A. So since I've been doing
20 this on my own for the last ten or so
21 years, let's see, I would say Allstate
22 has off and on been one of my larger
23 clients in comparison to other insurance
24 companies. So, yeah, I would say 100 to

Christoph J. Flaherty, P.E.

1 200 is probably a pretty good estimate.

2 Q. 100 to 200 in roughly a
3 ten-year span?

4 A. Ten-year period.

5 Q. What percentage of cases
6 you've worked on in the last five years
7 have been plaintiff versus defendant?

8 A. I think it has trended, I've
9 done both, I think it has trended more
10 towards plaintiff. So I would estimate
11 60 to 70 percent subrogation work.

12 Q. Which is what this is,
13 correct?

14 A. Yes.

15 Q. And when you say
16 "subrogation work," meaning you're on the
17 side that's trying to recover money?

18 A. I'm working on behalf of the
19 insurance company who is looking -- whose
20 interest is recovering money for their
21 claim, yes.

22 Q. How many active cases do you
23 have currently?

24 A. That kind of depends on how

Christoph J. Flaherty, P.E.

1 we would define active. Many cases go
2 dormant for a year or two and then
3 resurface.

4 Q. I'll say open. Open is a
5 better word.

6 A. I would estimate completely
7 around 50 to 60 open.

8 Q. Does Flaherty Engineering
9 Investigation perform any work that's not
10 claim/lawsuit related?

11 A. I've done -- well, I guess
12 personal plaintiff work would also be
13 considered lawsuit related. All of
14 Flaherty Engineering's work is in
15 forensic investigations focusing on
16 insurance claims or legal cases.

17 Q. What did you earn in 2019
18 from your forensic work?

19 A. In terms of gross income?

20 Q. Sure.

21 A. Let's see. I don't remember
22 exactly, but it's in the between 350,000
23 and \$380,000.00, in that range.

24 Q. How many employees does

Christoph J. Flaherty, P.E.

1 Flaherty Engineering have?

2 A. Just myself.

3 Q. Do you have a lab?

4 A. I -- not personally. I
5 contract with organizations in order to
6 provide laboratory space when it's
7 required.

8 Q. Do you have an office or do
9 you work out of your home?

10 A. I have a home office.

11 Q. What percentage of your open
12 files are fire related?

13 A. Approximately 80 percent.

14 Q. Are you a CFI?

15 A. No.

16 Q. Are you a CFEI?

17 A. I have previously been a
18 CFEI. My certification is not current.

19 Q. When did you become
20 certified CFEI something?

21 A. I was initially qualified in
22 2004. My certification lapsed I think in
23 2017, and I've perpetually intended to
24 recertify it. I just haven't managed to

Christoph J. Flaherty, P.E.

1 make that happen yet.

2 Q. Do you hold yourself out as
3 an expert in fire cause and origin?

4 A. As an expert in fire cause
5 and origin as relates to electrical
6 systems and -- yes. Not -- I would not
7 hold myself out as a fire investigator
8 per se.

9 Q. Have you ever worked for a
10 manufacturer of refrigerators?

11 A. I don't think so.

12 Q. Have you ever designed a
13 refrigerator?

14 A. Oh, I understand your
15 question now. I'm sorry. Your earlier
16 question I had interpreted to be if I had
17 ever worked as a forensic investigator on
18 behalf of a refrigerator manufacturer,
19 but I think the question you actually
20 asked was had I ever worked for a
21 refrigerator manufacturer.

22 Q. Correct.

23 A. And the answer to that is
24 no.

Christoph J. Flaherty, P.E.

1 Q. Have you ever designed a
2 refrigerator?

3 A. No.

4 Q. Have you ever designed a
5 component that was used in a
6 refrigerator?

7 A. No.

8 Q. Have you ever served on any
9 committee that deals with refrigerator
10 design or manufacture?

11 A. No.

12 Q. Have you ever designed any
13 home appliance?

14 A. No.

15 Q. Well, now I'll ask the
16 question that you initially thought I was
17 asking. Have you ever been retained by a
18 refrigerator manufacturer in a forensic
19 matter?

20 A. I don't recall a case in
21 which I have been.

22 Q. Have you been offered in --
23 go ahead.

24 A. I just remembered I was

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1 retained on behalf of a heating element
2 manufacturer of heating elements used in
3 refrigerators and freezers, but not I
4 don't think a refrigerator manufacturer.

5 Q. Was that one time or more
6 than one time?

7 A. One time for that particular
8 application. I say that because that
9 manufacturer also makes heating elements
10 in dishwashers for example.

11 Q. Who was the -- what was the
12 manufacturer of that heating element?

13 A. Backer Heating Technologies.

14 Q. And did you offer an opinion
15 in that matter?

16 A. There have been two, one
17 involving the heating element in a
18 dishwasher and one involving the heating
19 element in the door of a commercial
20 walk-in freezer or refrigerator. I can't
21 remember which it was.

22 Q. Did you offer an opinion in
23 the refrigerator or freezer case?

24 A. Those -- that investigation

Christoph J. Flaherty, P.E.

1 is ongoing. I haven't officially offered
2 any opinions for it. We have had
3 examinations and discussions regarding
4 what those mean.

5 Q. Okay. Other than in this
6 case, have you ever written a report in
7 which you expressed an opinion that a
8 refrigerator was defective?

9 A. I don't think so.

10 Q. Have you ever had other
11 cases involving refrigerators other than
12 the one, the walk-in freezer fridge that
13 you just referred to?

14 A. Yes.

15 Q. How many have you had?

16 A. Can you -- I want to narrow
17 this down just a little bit. Cases in
18 which a refrigerator was being considered
19 as a potential fire origin?

20 Q. Well, I'd rather not narrow
21 it down yet. I'd rather keep it broad,
22 but I can --

23 A. Through kitchen fire I've
24 done freezers and refrigerators, so that

Christoph J. Flaherty, P.E.

1 would be quite a number.

2 Q. Okay.

3 A. Most of them the
4 refrigerator is not considered a
5 potential ignition source based on the
6 fire investigator's investigation.

7 Q. So are you saying that
8 you've been retained on kitchen fires
9 where there was a refrigerator present,
10 but in the end the refrigerator was not
11 blamed for the fire?

12 A. Correct.

13 Q. Okay. Let me ask then, have
14 you ever been involved in a case where,
15 other than this one, where the
16 refrigerator was being blamed for the
17 fire?

18 A. Yes.

19 Q. And in those cases, have you
20 been the person blaming the refrigerator
21 for the fire?

22 MR. McGLYNN: Objection.

23 THE WITNESS: In the -- in
24 the one other case that I can

Christoph J. Flaherty, P.E.

1 think of, the fire -- I assisted a
2 fire investigator in determining
3 that the origin of the fire was
4 inside the refrigerator. Due to
5 the fact of that particular case,
6 they didn't decide to attempt to
7 pursue that subrogation against
8 the refrigerator manufacturer, so
9 it never progressed to a finding
10 of a particular defect within the
11 refrigerator.

12 BY MR. VOTER:

13 Q. What brand of refrigerator
14 was that?

15 A. I don't know, and I don't
16 think we knew at the time either.

17 Q. How long ago was this?

18 A. Probably two or three years
19 ago.

20 Q. Is that file closed as far
21 as you know?

22 A. Yes.

23 Q. Who was the other
24 investigator that you assisted?

Christoph J. Flaherty, P.E.

1 A. I assisted Joe Sobota who is
2 a fire investigator.

3 Q. Did you determine what the
4 cause of that fire was?

5 A. Not other than it had
6 started in the refrigerator and that
7 causes associated with the refrigerator
8 wiring would need to be investigated
9 where at the point a manufacturer would
10 have to be notified, put on notice, and
11 then joint examinations planned when the
12 investigation was decided not to be
13 pursued and shut down.

14 Q. Was there damage outside of
15 the refrigerator --

16 A. Yes.

17 Q. -- in that matter?

18 A. Yes.

19 Q. Was a location within the
20 refrigerator identified as the point of
21 origin?

22 A. Within -- I think it was
23 basically within the center of the
24 refrigerator. I can't -- I can't

Christoph J. Flaherty, P.E.

1 remember. I think this one had a freezer
2 compartment on the top, so my
3 recollection is just the sort of center
4 of the structure of the refrigerator, but
5 it could have been more towards the top
6 side of the refrigeration compartment.
7 It was definitely within the
8 refrigeration compartment.

9 Q. Do you know what industry
10 standard relates to the design of a
11 refrigerator like the one involved in the
12 Ellis case?

13 A. I'm sure there are UL
14 standards that relate to the refrigerator
15 manufacture, but I don't know the
16 specific one.

17 Q. Okay. But by specific one,
18 I'd like to ask specifically.

19 A. Joe is --

20 Q. Do you know the number of
21 the -- oh, what's the matter?

22 (Mr. McGlynn lost audio
23 connectivity.)

24 MR. McGLYNN: Sorry about

Christoph J. Flaherty, P.E.

1 that.

2 BY MR. VOTER:

3 Q. I think I was asking about
4 the standard that applies to refrigerator
5 design and manufacture. Do you know what
6 the number of that standard is?

7 A. No.

8 Q. Are you aware of whether the
9 organization that issues the standard
10 that applies to the design of
11 refrigerators approved the design of the
12 Ellis's refrigerator?

13 A. My understanding is that it
14 was UL listed, so then it would have been
15 approved.

16 Q. Have you ever performed any
17 testing on a refrigerator?

18 A. No.

19 Q. I assume you own a
20 refrigerator?

21 A. Yes.

22 Q. What brand is it?

23 A. I think it's a KitchenAid.

24 Q. I assume you've never

Christoph J. Flaherty, P.E.

1 authored any articles on refrigerator
2 design or fires. Is that a fair
3 statement?

4 A. Yes.

5 Q. Have you ever been precluded
6 from testifying by a court?

7 A. No.

8 Q. Have you ever given a
9 seminar or presentation to Allstate on
10 any topic?

11 A. No.

12 Q. Have you ever given a
13 presentation to any group or organization
14 on appliance fires?

15 A. I did one talk with
16 representatives of I think State Farm
17 focusing on forensic investigations in
18 general. I believe appliance fires was a
19 covered topic in that.

20 Q. You used the term "defect"
21 and "defective," I forget which, in your
22 complaint when describing the
23 refrigerator at issue. Do you recall
24 that?

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1 A. Yes.

2 Q. What does -- how do you
3 define defect?

4 A. As an error in either the
5 manufacture or the design that would lead
6 to damage or malfunction of the
7 appliance.

8 Q. Do you distinguish between a
9 design defect and a manufacturing defect?

10 MR. McGLYNN: The question
11 was did you or do you?

12 MR. VOTER: Do you.

13 MR. McGLYNN: Based on this
14 case obviously.

15 THE WITNESS: Yes.

16 BY MR. VOTER:

17 Q. Let's talk about your other
18 opinion having to do with the arc on the
19 wiring harness. Was that -- you've
20 identified that as a defect in this
21 refrigerator, correct?

22 A. I've identified that as a,
23 either a cause or a symptom of the fire
24 in the top of this refrigerator.

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1 Q. I stand corrected. You've
2 identified it as one of two potential
3 causes of the fire, correct?

4 A. Correct.

5 Q. Okay.

6 A. And if it was the cause,
7 then that would represent being due to a
8 defect in the manufacture of the
9 refrigerator.

10 Q. Okay, fine. So you said a
11 defect in the manufacture of the
12 refrigerator, and I want to be very
13 clear. You're distinguishing between --
14 you're specifically using the word
15 "manufacture" as opposed to the design,
16 correct?

17 A. Yes.

18 Q. What was the manufacturing
19 defect as it related to the wiring
20 harness?

21 A. Its installation that would
22 subject it to physical damage, either
23 damage done during manufacture or a
24 routing issue or error that caused the

Christoph J. Flaherty, P.E.

1 insulation to be subject to physical
2 damage after manufacture.

3 Q. With respect to the wiring
4 harness, am I correct that you're not
5 critical of the design of the
6 refrigerator?

7 A. That's correct.

8 Q. Your only criticism
9 potentially is that the wiring harness
10 was installed improperly or that there
11 was a routing error that would do what?

12 A. Subject it to physical
13 damage, subject the wiring insulation to
14 physical damage.

15 Q. Okay. What is the
16 difference between those two?

17 MR. McGLYNN: Objection.

18 BY MR. VOTER:

19 Q. Well, you stated that
20 installation error or a routing error.
21 What's the difference between the two
22 things?

23 A. Well, installation would be
24 general routing as just the specific

Christoph J. Flaherty, P.E.

1 example of an installation error.

2 Q. How many years before the
3 fire was the refrigerator manufactured?

4 A. 12.

5 Q. Is there any evidence
6 that -- before the fire, are you aware of
7 any evidence that would support an
8 opinion that there was an installation
9 error or routing error in the
10 refrigerator?

11 A. Absent the occurrence of --
12 you said before the fire, so no.

13 Q. No evidence before the fire
14 that would support an opinion that there
15 was a manufacturing defect in the
16 refrigerator, fair?

17 A. Yes.

18 Q. I'm going to ask you to draw
19 a bird's eye view of the top of the
20 refrigerator as if you're above it
21 looking down. So basically it's going to
22 be, I don't know if it's a square or a
23 rectangle, but can you draw that, and I'm
24 going to ask you to identify the

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1 different sides of the refrigerator as
2 being the door side, and then I'm going
3 to ask you to show me the routing of the
4 wiring harness at issue. Okay? And then
5 we're going to mark it as Flaherty-6, and
6 I will ask you when we're done to scan it
7 and e-mail it to Mr. McGlynn and I.

8 A. Okay.

9 Q. Or send it to Mr. McGlynn
10 who will send it to me.

11 Actually, can we take a
12 five-minute break while you do
13 that?

14 A. Yes.

15 MR. VOTER: Is that okay
16 with everybody?

17 MR. McGLYNN: Yes.

18 (Recess; 1:24 p.m.)

19 (Resumed; 1:34 p.m.)

20 BY MR. VOTER:

21 Q. Mr. Flaherty, did you
22 draw -- oh, you've got it on your
23 computer.

24 A. Is that kind of what you're

Christoph J. Flaherty, P.E.

1 looking for?

2 Q. Even better. So I assume F
3 is front?

4 A. Yes.

5 Q. You've got left, right,
6 front and back. And what is in the left
7 front corner area, what is the small
8 rectangle?

9 A. I put a small rectangle to
10 represent the cutout in the top of the
11 refrigerator that the wiring harness
12 transits through to get to the door.

13 Q. Okay. I'll refer to the
14 rectangle in which the little rectangle
15 exists as the refrigerator cabinet, and
16 then you've got the two doors indicated,
17 correct?

18 A. Yes.

19 Q. All right. So how does
20 it -- when the wiring harness exits the
21 cabinet, how does it get into the door?

22 A. It goes across the hinge and
23 through a series of connectors to connect
24 to the door wiring which goes down into a

Christoph J. Flaherty, P.E.

1 guide or conduit in the door hinge.

2 Q. Where are these connectors
3 located?

4 A. Yeah, they're located in
5 that space in between the where it comes
6 out of the refrigerator cabinet, so the
7 area just above the hinge of the door.

8 Q. And is that what I'll call
9 normal operation? Are those connectors
10 visible to somebody looking in that area?

11 A. No.

12 Q. What prevents them from
13 being visible?

14 A. They're covered by a plastic
15 shield or guard.

16 Q. I want you to assume that we
17 can see through the top of the
18 refrigerator and we could see the route
19 that the wiring harness takes from where
20 it enters the cabinet to where it exits
21 the cabinet. Can you draw what that path
22 is?

23 A. Yes, I think I can.

24 (Pause.)

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1 A. All right. So this is not
2 perfect.

3 Q. Okay.

4 A. In fact, I think I will add
5 one thing just for a little bit of
6 clarity.

7 (Pause.)

8 A. Okay. So in what would be
9 the top right corner as you're looking at
10 it, which would be the back right corner
11 of the refrigerator, I added a small
12 rectangle to indicate the approximate
13 location of the control board
14 compartment, although that control board
15 compartment is down several feet from the
16 top of the refrigerator.

17 And then the straight line
18 of sort of magenta highlight that
19 transits along the back of the
20 refrigerator is supposed to indicate the
21 portion of the wiring harness that is
22 running up the back of the refrigerator.
23 And as it's running up the back, it's
24 also coming a little bit more towards the

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1 center from where it started. And then
2 the diagonal more wandering line I guess
3 you could say that extends from the back
4 of the refrigerator to the small
5 rectangular cutout is intended to
6 represent the approximate routing of the
7 wiring harness across the ceiling of the
8 refrigerator, of the cabinet.

9 Q. Okay. Are you able to
10 e-mail that to Mr. McGlynn and me?

11 A. Yes. Do you want me to do
12 that now?

13 Q. Yeah, please. Actually, you
14 know what. Let me ask you to hold off.
15 I'll probably ask you to make some more
16 marks on it.

17 So at the end opposite of
18 where it exits the cabinet and transits
19 to the hinge or to the door, is the wire
20 harness connected to the circuit board?

21 A. Yes, there are -- well,
22 there is multiple connections that are
23 part of the wiring harness. I think two
24 or three of them connect directly to the

Christoph J. Flaherty, P.E.

1 circuit board and one of them connects to
2 other wiring in that same compartment.

3 Q. The wiring harness is
4 actually a collection of several wires;
5 is that correct?

6 A. Yes, it is a bundle of
7 wires.

8 Q. So does that bundle from
9 where it leaves the area of the main
10 circuit board, does that bundle travel
11 within the refrigerator or on the outside
12 of the cabinet?

13 A. It's inside, inside the
14 cabinet.

15 Q. And when it gets to the top
16 of the refrigerator cabinet, what
17 direction does it go?

18 A. It goes across the top, but
19 still inside the cabinet until it gets to
20 the cutout in the vicinity of the door
21 hinge.

22 Q. Okay. You have that one
23 section of straight magenta that goes in
24 your two-dimensional diagram. It goes

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1 from the right side to the left side,
2 correct?

3 A. Yes.

4 Q. And does that represent the
5 actual direction of travel of the wiring
6 harness across the ceiling of the
7 refrigerator?

8 A. No. That represents the
9 horizontal travel of the wiring harness
10 while it's coming from the control box up
11 to the level of the ceiling. So the
12 projection, you know, since this is a
13 top-down view, I can't show the vertical
14 routing of the wiring harness, but that
15 straight line across the back is intended
16 to just represent the horizontal travel
17 of the wiring harness in the portion of
18 where it's traveling primarily vertically
19 from the control box up to the ceiling of
20 the cabinet.

21 Q. So if you were standing
22 behind the refrigerator and could see
23 through the metal rear of the cabinet,
24 you'd see the wiring harness going mostly

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1 vertical but also moving horizontally
2 from left to right?

3 A. Yes, and that straight
4 portion is intended to represent the
5 horizontal component.

6 Q. And how far from the back
7 right corner of the cabinet is the spot
8 where the wiring harness makes it to the
9 ceiling of the refrigerator cabinet?

10 A. At the ceiling level, I
11 would say approximately one foot from the
12 corner.

13 Q. Okay. And then it uses
14 that, I forgot what you used, wandering,
15 but it's essentially a diagonal line but
16 not necessarily a straight line?

17 A. Yes, from that point to the
18 cutout near the door hinge.

19 Q. And what if anything is
20 around the wiring harness between where
21 it reaches the ceiling and where it
22 makes -- and where it exits the cabinet?

23 A. In that entire area it's
24 encased in the polyurethane foam

Christoph J. Flaherty, P.E.

1 insulation of the refrigerator.

2 Q. And by encased, you mean
3 it's literally got foam all around it,
4 right?

5 A. Yes, it should, and there is
6 nothing here to indicate that it didn't.

7 Q. Does it move?

8 A. The portions where it's in
9 the foam, it should not move.

10 Q. And to be fair, you say in
11 your report that the arc on the wire
12 could be a victim or a consequence of the
13 fire and not the cause of the fire,
14 correct?

15 A. Correct.

16 Q. And by that you mean if the
17 fire started elsewhere and there was
18 enough heat in the area where the wiring
19 harness was, it could melt the insulation
20 on a wire which would then expose
21 conductors and produce an arc, correct?

22 A. Correct.

23 Q. So if you used the
24 refrigerator, opening the door, closing

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1 the door, nothing is happening to move
2 the wiring harness between where it
3 reaches the ceiling and where it exits
4 the cabinet, correct?

5 A. Correct.

6 Q. Okay.

7 A. How much it's moving when it
8 exits the cavity would depend on the
9 specific routing and installation in that
10 area.

11 Q. Well, have you ever looked
12 at an exemplar of this model refrigerator
13 to see exactly how that area is designed?

14 A. If it's designed and
15 installed properly there should be very
16 little if any movement in that area.

17 Q. Okay. My question is, did
18 you ever look at an exemplar of this
19 model refrigerator to see how the area
20 where it exits the cabinet and enters the
21 hinge is designed?

22 A. I looked at the design
23 documents. I never looked at an
24 exemplar.

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1 Q. And in your report you
2 include some photographs that show the
3 area where you believe the arc was
4 located, correct?

5 A. Correct.

6 Q. And can you draw on the
7 diagram, Flaherty-6, you've reproduced
8 the area. I think you did it with a
9 circle or an oval. Can you reproduce
10 that onto that diagram to show the area
11 where the arc location could have been?

12 A. Yes. So I'm trying to get
13 the oval that I'm drawing to line up with
14 what I want it to, and it's -- no, I
15 think that probably isn't -- that's not
16 quite. There we go. I think that will
17 probably do it. Yeah.

18 Q. Okay. I guess now can you
19 e-mail that to Mr. McGlynn and myself?

20 A. Your e-mail address, sir?

21 Q. It's warren.voter,
22 v-o-t-e-r, @sweeneyfirm,
23 s-w-e-e-n-e-y-f-i-r-m.com.

24 A. Did you say n-e-y?

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1 Q. Yes.

2 A. Okay. All right. I
3 neglected to CC myself.

4 MR. VOTER: Okay. Did you
5 get it Joe? I did.

6 MR. McGLYNN: Yeah.

7 (Exhibit Flaherty-6 was
8 marked for identification.)

9 BY MR. VOTER:

10 Q. Okay. Do you mind holding
11 it up again just so I can recall what it
12 looks like?

13 A. Sure.

14 Q. Okay. What is the distance
15 in inches between the two ends of the
16 oval?

17 A. Well, it's an approximate
18 location, so I can give you an
19 approximation.

20 Q. Okay.

21 A. I would say approximately 12
22 inches.

23 Q. And what's the -- how much
24 of that is outside of the refrigerator?

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1 A. When you say "outside of the
2 refrigerator," you mean after it
3 transitions?

4 Q. Yeah, lousy question. How
5 much of the area encompassed by the oval
6 is wiring harness that's left or that has
7 left the cabinet and is transitioning or
8 transitioned to the hinge?

9 A. Okay. So when I drew the
10 wiring harness line on the refrigerator,
11 I only drew the portion that was inside
12 the cabinet, so the line ends right at
13 the cutout.

14 Q. Understood.

15 A. The -- my oval would extend
16 in the two to three inches outside the
17 cabinet there.

18 Q. Okay. So of the roughly 12
19 inches of oval, three inches of it would
20 be outside of the refrigerator cabinet?

21 A. The -- yes, the last two to
22 three inches would be outside the middle
23 cabinet of the refrigerator.

24 Q. And in that two to three

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1 inches, has it already gotten to the
2 hinge or is it still transitioning to the
3 hinge?

4 A. No, that would be
5 transitioning to the connectors and then
6 connecting to the wiring which then goes
7 into the hinge.

8 Q. Okay. So it connects
9 with -- it connects with wires that go
10 into the hinge or go through the hinge,
11 right?

12 A. Yes.

13 Q. And are you certain that the
14 end of the wiring harness at issue ends
15 short of the hinge?

16 A. Yes.

17 Q. Okay.

18 MR. McGLYNN: Objection.

19 BY MR. VOTER:

20 Q. So the hinge can't have
21 played any role in this, correct, because
22 it hadn't gotten to the hinge yet?

23 A. No, the motion of the hinge
24 certainly could, but in terms of the

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1 physical location, the harness ends in a
2 connector in the hinge, in the hinge
3 assembly for the lack of a better term,
4 the plastic guards and covers that
5 covered the structural portions of the
6 hinge.

7 Q. Okay. Now, assuming that
8 the arc wasn't the result of the fire,
9 what could the routing error have been?
10 What sort of or what routing error do you
11 envision for the cause of the arc?

12 A. So possible manufacturing
13 defects in that area leading to the
14 susceptibility for damage would be the
15 inadequate securing of that portion of
16 the wiring harness so that it is subject
17 to movement, and positioning of that
18 wiring harness against edges that could
19 damage it as a result of that movement.

20 Q. Okay. Are there any edges
21 that could damage the wire?

22 A. The edges of the hole that
23 it transitions through coming out of the
24 refrigerator.

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1 Q. What's that hole -- what's
2 the material that the wiring harness
3 coming out of the cabinet made of?

4 A. The material of the wiring
5 harness?

6 Q. I'm sorry. I was afraid I
7 got my question mixed up. The wiring
8 harness comes out of a hole in the top of
9 the refrigerating cabinet, right?

10 A. Yes.

11 Q. And is there some sort of
12 grommet or something that creates the
13 hole or provides a, you know, a different
14 surface than just metal?

15 A. I don't know. There should
16 be to protect it well.

17 Q. Okay.

18 A. The manufacturing issue
19 could be that there was no such
20 protection.

21 Q. Okay. Do you have any
22 evidence that there was no such
23 protection at the hole where the wiring
24 harness comes through the cabinet?

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1 MR. McGLYNN: Objection.

2 THE WITNESS: Not from
3 anything prior that we took.

4 I think everybody just froze
5 up. No.

6 BY MR. VOTER:

7 Q. I was thinking for a second.

8 Prior to the fire, was there
9 any evidence that you're aware of that
10 there had been a routing error with the
11 wiring harness?

12 MR. McGLYNN: Objection.

13 THE WITNESS: No.

14 BY MR. VOTER:

15 Q. Other than the fire, is
16 there any evidence that the wiring
17 harness had been damaged during
18 installation ten years earlier?

19 A. No.

20 Q. I just want to set up my
21 question properly. Am I correct that if
22 I knew where the arc was at the moment
23 that the arc occurred, I'd know where
24 along that wiring harness line that

Christoph J. Flaherty, P.E.

1 you've drawn, where it was located? That
2 sounds like a horrible question.

3 Let me try again. What the
4 oval represents is the area, area of the
5 length or of a section of the wiring
6 harness where the arc location could have
7 been?

8 A. Yes.

9 Q. Okay. So the location where
10 the arc occurred could have been inside
11 the cabinet or it could have been outside
12 of the cabinet, correct?

13 A. Yes, or right at the
14 entrance to the cabinet.

15 Q. Right, okay. And you don't
16 know where the location of the arc was at
17 the moment that the arc occurred?

18 MR. McGLYNN: Objection.

19 THE WITNESS: Other than my
20 estimated area, that's right.

21 BY MR. VOTER:

22 Q. Okay. And have you done any
23 tests to determine if an arc somewhere on
24 that two-inch segment outside of the

Christoph J. Flaherty, P.E.

1 cabinet could produce a fire inside the
2 cabinet?

3 MR. McGLYNN: Objection.

4 THE WITNESS: Could
5 transition or could ignite the
6 foam that's right there, well, I
7 haven't done any testing, no.

8 BY MR. VOTER:

9 Q. Okay. Well, once it leaves
10 the cabinet, it's not in contact with
11 foam anymore, correct?

12 A. Correct.

13 Q. So let me be clear again.
14 If the arc occurred in that two-inch
15 section outside the cabinet, have you
16 done any testing to determine whether an
17 arc location there could produce the fire
18 inside the cabinet?

19 A. No.

20 Q. Have you done any testing to
21 determine if an arc in the area of the
22 wiring harness that's encased in foam
23 could produce a fire inside the cabinet
24 that would be scientifically similar to

Christoph J. Flaherty, P.E.

1 the fire or to the damage inside the
2 refrigerator that you see now?

3 MR. McGLYNN: Objection;
4 form, asked and answered.

5 THE WITNESS: Well, that was
6 the challenge we faced in
7 considering any testing, which is
8 we did not have enough data to
9 create what could be argued to be
10 a scientifically similar
11 environment in order for the
12 testing to be potentially
13 meaningful. So the short answer
14 to your question is no. The long
15 answer is because it wouldn't have
16 been meaningful.

17 BY MR. VOTER:

18 Q. What methodology did you use
19 in analyzing this fire?

20 A. I used the fire
21 investigation -- the general fire
22 investigation techniques of 921, although
23 in my investigation of this fire it was
24 limited to analysis of potential

Christoph J. Flaherty, P.E.

1 electrical fire causes and specific to
2 potential fire cause, also potential fire
3 causes within the refrigerator itself.

4 Q. You referred to 921. Is
5 that NFPA 921?

6 A. Yes.

7 Q. Could you articulate the
8 steps in the NFPA 921 methodology?

9 A. To gather data, form
10 hypotheses, test hypotheses, reanalyze
11 hypotheses. It's my sort of memory,
12 meaning I'm doing those from memory right
13 now.

14 Q. I have gather data, read
15 hypotheses, test hypotheses, reanalyze
16 hypotheses. Anything else?

17 A. The -- and in order to
18 arrive at a definitive cause, you would
19 select the final hypothesis and look at
20 alternate causes.

21 Q. You said select final
22 hypothesis and then look at alternate
23 causes?

24 A. Yes. I would say that was a

Christoph J. Flaherty, P.E.

1 portion of -- a part of selecting our
2 final hypothesis would be to consider, to
3 reconsider ultimate causes that would
4 contraindicate your final hypothesis,
5 look for contraindications.

6 Q. Okay. I'm a little
7 confused. Gather data, create
8 hypotheses, test hypotheses, reanalyze
9 hypotheses, and select final hypothesis,
10 and then if it's a final hypothesis, what
11 do you do with that?

12 A. Well, then that would be the
13 cause.

14 Q. Okay.

15 A. If you're able to eliminate
16 your other hypotheses, your selection of
17 the final hypothesis would be the cause.

18 Q. Okay. What is a hypothesis?

19 A. A hypothesis is a scientific
20 idea that you can test.

21 Q. Have you ever been involved
22 in a case where you were unable to come
23 up with the cause of a fire?

24 A. Yes.

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1 Q. And is it fair to say that
2 if you can't get to, as you go through
3 the scientific method of 921, if you
4 can't get to a final hypothesis, then
5 you're unable to come up with the cause
6 of the fire, correct?

7 MR. McGLYNN: Objection.

8 BY MR. VOTER:

9 Q. Okay. You can answer.

10 A. Short from the -- you're not
11 able to say what the definitive cause
12 was, yes, correct.

13 Q. And am I correct that you
14 did not come up with a final hypothesis
15 for the cause of this fire?

16 MR. McGLYNN: Object.

17 THE WITNESS: That is
18 correct. In this fire I did not
19 select a final hypothesis because
20 I have two -- I have competing
21 hypotheses, either of which could
22 have caused the fire.

23 BY MR. VOTER:

24 Q. And am I correct that you

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1 made -- you performed no testing with
2 respect to either of the potential
3 hypotheses that you came up with in this
4 case, correct?

5 MR. McGLYNN: Object.

6 THE WITNESS: I determined
7 that testing that I might perform
8 would not be valuable in trying to
9 narrow it down.

10 BY MR. VOTER:

11 Q. Well, let's be clear. Did
12 you do any testing as to -- or did you do
13 any testing with regard to either of your
14 hypotheses?

15 A. No.

16 Q. Did you ever visit the fire
17 scene?

18 A. No, I did not.

19 Q. There is a reference in your
20 report to Fire Chief Givens. Do you
21 recall who he is?

22 A. Yes.

23 Q. Do you know what his
24 qualifications are as a fire

Christoph J. Flaherty, P.E.

1 investigator, if any?

2 A. No.

3 Q. Can I assume from your
4 earlier answers that you did no testing
5 to determine whether an arc that occurs
6 within the area where the wiring harness
7 is surrounded by foam, that that could
8 create a fire that is sustained within
9 the refrigerator?

10 MR. McGLYNN: Objection.

11 THE WITNESS: That's
12 correct.

13 BY MR. VOTER:

14 Q. Did you conduct any research
15 with respect to either of your
16 hypotheses?

17 MR. McGLYNN: Objection.

18 THE WITNESS: Yes.

19 BY MR. VOTER:

20 Q. What research did you
21 perform?

22 A. The research into the, what
23 we've been referring to as the light
24 overheating issue and its previous

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1 occurrences, damage that could be caused
2 by that. And then other than that, it
3 would just be the basic -- I didn't
4 perform any additional research specific
5 to this case. It would just be the
6 basics concerning electrical arc
7 generation, the response of electrical
8 systems to fires and the capability of
9 electrical ignition sources to ignite
10 fires.

11 Q. Well, so the only research
12 that you did was review of the root cause
13 analysis that was conducted by LG Korea,
14 correct?

15 A. In addition to just the
16 occurrence of -- additional occurrences
17 of reported light overheating failures.
18 Separate from their analysis, just the
19 reported incidents of that occurring.

20 Q. Well, you've indicated
21 previously that those materials simply
22 gave you reason to --

23 A. Consider it.

24 Q. -- consider the light as a

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1 possible source of the fire, right?

2 A. Correct.

3 Q. Am I correct that you didn't
4 do any of your own research on that, but
5 you reviewed the work done by LG Korea,
6 correct?

7 A. I guess I would qualify my
8 work as research. Are you --

9 Q. Well, let's not quibble over
10 the word "research." The only technical
11 information that you reviewed was the
12 work that was done by LG Korea, correct?

13 A. Specific to fire in that
14 refrigerator, yes.

15 Q. Okay. Well, and in this
16 case, right?

17 MR. McGLYNN: Objection.

18 THE WITNESS: Well, I mean
19 I've reviewed lots of technical
20 work concerning fire causes or
21 fire, interactions of fire and
22 electrical systems and electrical
23 fire causes in general.

24 BY MR. VOTER:

Christoph J. Flaherty, P.E.

1 Q. Well, I'm certain of that.
2 I'm talking about any research relating
3 to the issues in this case. The only
4 material you reviewed was what was done
5 by LG Korea, right?

6 MR. McGLYNN: Well,
7 objection. Objection.

8 BY MR. VOTER:

9 Q. You can answer the question.

10 A. In terms of technical
11 analysis of this particular refrigerator
12 model, the only material I've reviewed is
13 that produced by LG.

14 Q. Okay. And the analysis done
15 by LG showed that the light bulb, even
16 without thermal protection, the light
17 bulb doesn't get hot enough to ignite
18 material inside the refrigerator; am I
19 correct?

20 MR. McGLYNN: Objection.

21 THE WITNESS: LG showed that
22 it wouldn't ignite their
23 refrigerator materials, not that
24 it couldn't ignite materials

Christoph J. Flaherty, P.E.

1 inside the refrigerator.

2 BY MR. VOTER:

3 Q. Well, how hot does it -- did
4 it get?

5 MR. McGLYNN: Objection.

6 THE WITNESS: Are you --

7 MR. McGLYNN: Hold on a
8 second. Objection. How hot could
9 it get where, and what are you
10 talking about?

11 MR. VOTER: In the test
12 result.

13 MR. McGLYNN: LG's test
14 results?

15 MR. VOTER: Yeah.

16 BY MR. VOTER:

17 Q. Do you know?

18 A. Yes.

19 Q. What's the number?

20 A. This goes back to my issue
21 with why we didn't do testing in the
22 particular, which is how hot it's going
23 to get depends on how it's -- how
24 everything in the refrigerator is

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1 arranged, what's in the refrigerator, how
2 close it is to the light. All of those
3 factors are variables. With an empty
4 refrigerator with nothing in it, I think
5 they measure temperatures in the 180
6 degree range.

7 Q. And you didn't do any
8 testing or independent analysis to see if
9 some different temperature would be
10 reached under different conditions, is
11 that a fair statement?

12 A. Based on the considerations
13 and reasons that I previously stated, I
14 did not do any testing.

15 MR. VOTER: Okay. That's
16 all the questions I have. I may
17 have some questions if Mr. McGlynn
18 asks you questions, but either way
19 thank you for your patience.

20 THE WITNESS: Yes, sir.

21 - - -

22 EXAMINATION

23 - - -

24 BY MR. MCGLYNN:

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1 Q. Okay. Mr. Flaherty, were
2 you asked to evaluate the evidence in
3 this case in light of Mr. Buckley's
4 conclusion that the fire had started
5 within the top-third portion of this
6 Ellis refrigerator?

7 A. Yes.

8 Q. And was the evidence as you
9 evaluated it consistent with Mr.
10 Buckley's determination that the fire had
11 originated within the top-third portion
12 of the refrigerator?

13 A. Yes.

14 Q. And in fact, you had
15 identified at a lab exam an electrical
16 arc located within the top-third portion
17 of the subject refrigerator; is that
18 correct?

19 A. Yes.

20 Q. Okay. Could that electrical
21 arc could have caused this fire?

22 A. Yes.

23 Q. Okay. So I'm just going to
24 walk you through if you would, if you

Christoph J. Flaherty, P.E.

1 want to turn to your I think it's been
2 marked as Exhibit 1, the conclusions in
3 your report, and it's I believe Page 6.
4 No. 1 lists, "All potential electrical
5 failures external to the refrigerator in
6 the Ellis residence were eliminated as
7 possible fire causes. Potential failures
8 considered included failures of the power
9 cords of either the refrigerator or
10 range, failure of the green extension
11 cord behind the range, failure of the
12 house branch circuit wiring or outlets,
13 failure of the range's electronics or
14 internal wiring."

15 Is that still your opinion
16 and do you hold that opinion within a
17 reasonable degree of engineering
18 certainty?

19 A. Yes to both.

20 Q. Okay. And let's move to No.
21 2. "The location of the electrical
22 arcing identified on the FD-HTR circuit
23 in the left forward quadrant of the top
24 to the refrigerator is consistent with a

Christoph J. Flaherty, P.E.

1 fire starting in the front of the top
2 part of the refrigerator."

3 Is that still your opinion
4 and do you hold that within a reasonable
5 degree of engineering certainty?

6 A. Yes to both again.

7 Q. Okay. Conclusion No. 3,
8 which is, "The observed location of the
9 electrical failure in the top left
10 forward corner of the refrigerator
11 provides arc-mapping substantiation to
12 Mr. Buckley's elimination of the
13 stove-top as a potential area of fire
14 origin and his determination that a fire
15 originated in the top of the
16 refrigerator."

17 Okay. Do you still hold
18 that opinion and do you hold that within
19 a reasonable degree of engineering
20 certainty?

21 A. Yes, in both cases again.

22 Q. Okay. Can you explain to us
23 what you mean when you say -- well, first
24 of all, what is arc-mapping and why does

Christoph J. Flaherty, P.E.

1 that provide substantiation in this case
2 to Mr. Buckley's conclusion that the
3 stovetop was eliminated as a potential
4 area of fire origin?

5 A. Arc-mapping describes the
6 process of using locations of identified
7 electrical arcing to aid in determining
8 the fire spread, and in many cases it can
9 be used to help identify a fire area of
10 origin or to serve as an additional
11 method to substantiate or support an area
12 of origin determined through other means.

13 Arc-mapping is based on the
14 principle that an energized electrical
15 circuit attacked by fire will tend to
16 short-circuit and cause arcing which
17 results in melting of conductors that can
18 be physically observed after the fire.

19 And then where those
20 instances occur and form the fire spread,
21 in this particular instance the wiring
22 harness had an electrical arc at the top
23 left forward quadrant of the
24 refrigerator. That harness transited

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1 from the control panel which was at the
2 back right, probably about halfway up the
3 refrigerator as we diagramed.

4 And Mr. Buckley and I
5 discussed this specifically regarding a
6 stovetop fire. If a stovetop fire had
7 attacked the refrigerator from the side,
8 would we expect the refrigerator
9 materials to burn sufficiently to damage
10 the wiring harness in that area before
11 damaging the wiring harness in the top
12 left corner of the refrigerator.

13 I asked him, you know, in
14 order for the fire to have started on the
15 stovetop and to cause the arcing in the
16 vicinity of the left top, in the left
17 forward top quadrant, the fire would have
18 to have burned up from the stovetop
19 across the top of the refrigerator and
20 then down to the area of that hinge prior
21 to compromising the harness in any other
22 area before that, and he categorically
23 ruled out that possibility based on the
24 fire spreading patterns that he analyzed.

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1 Q. Okay. So let me just go ask
2 you a couple follow-up questions to what
3 you just said. Hold on, bear with me
4 because I just lost my place.

5 So, in other words, you
6 believe that you wouldn't have that
7 electrical arcing which means that that
8 location, that front forward left portion
9 were energized had the fire been started
10 on the stovetop. Is that what you just
11 said?

12 MR. VOTER: Object to the
13 form.

14 THE WITNESS: The -- that
15 was --

16 BY MR. McGLYNN:

17 Q. I guess what I want to know
18 is, how do you explain I guess in
19 layman's terms what you mean when you say
20 that the electrical arc-mapping
21 substantiates Buckley's elimination?

22 I know that you told us Mr.
23 Buckley conclusively eliminated a
24 stovetop fire. Why does this electrical

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1 arc support that elimination? I'm just
2 asking you to finish your thought that
3 you started a moment ago.

4 A. Because the electrical arc
5 occurring in this close to the end of the
6 wiring harness concentrates the first and
7 most intense fire attack to that wiring
8 harness in that area. The -- that
9 substantiates his determination because
10 had the fire started on the stovetop, it
11 should have attacked it closer to the
12 control box.

13 Q. Okay. So I guess what I'm
14 asking is on one hand it supports Mr.
15 Buckley's conclusion that the fire
16 started within that top-third quadrant;
17 is that correct?

18 A. Yes.

19 Q. Okay. And on the other hand
20 it supports Mr. Buckley's elimination of
21 the stovetop as a potential cause of the
22 fire; is that correct?

23 A. Yes. I wouldn't say that
24 it's sufficient in and of itself to

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1 eliminate the stovetop fire, but as I
2 said in my report, it substantiates it.

3 Q. Yeah. Well, and you're not
4 even being asked to determine whether a
5 stovetop fire happened here or not; is
6 that right?

7 A. Yes.

8 Q. Okay. So that's simply all
9 I'm asking you, whether or not that
10 specific piece of evidence supports Mr.
11 Buckley's determination.

12 MR. VOTER: Object to the
13 form.

14 THE WITNESS: Yes.

15 BY MR. McGLYNN:

16 Q. Okay. And in support of
17 your evaluation and conclusion that the
18 evidence in this case supports Mr.
19 Buckley's determination, can you tell me
20 whether or not you reviewed Mr. Ferrese's
21 photographs from the scene and an
22 evidence exam?

23 A. Yes, I did review Mr.
24 Ferrese's photos.

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1 Q. Did you review Mr. Buckley's
2 photographs from the scene and multiple
3 scene exams and the evidence exam?

4 A. I don't recall seeing Mr.
5 Buckley's photos.

6 Q. Okay. Did you ever see
7 other photographs from a scene exam that
8 would have been incorporated in any of
9 your materials?

10 A. Just Mr. Ferrese's
11 photographs.

12 Q. All right. Well, I mean,
13 obviously I'm assuming you saw Mr.
14 Buckley's report, right?

15 A. Yes.

16 Q. And in looking at his report
17 you saw his photographs taken from the
18 first and second site exams, correct?

19 A. So I would have seen any
20 photographs in Mr. Buckley's report.

21 Q. Okay. I also want to ask
22 you, you then conducted your -- Ferrese,
23 Mr. Ferrese or Dr. Ferrese did his own
24 evidence exam, is that correct, and took

Christoph J. Flaherty, P.E.

1 pictures of that?

2 A. Yes.

3 Q. Okay. And on top of that,
4 you yourself did an evidence exam of the
5 evidence retained in this case, correct?

6 A. Yes.

7 Q. Did you trace out the wiring
8 to the wiring harness?

9 A. At the time doing my
10 evidence exam, I traced out the wiring
11 portion of that since it had been removed
12 previously by Mr. Ferrese. Fortunately
13 it had been done in a very careful and
14 well-documented fashion in that each
15 individual conductor was tagged before it
16 was cut, so we were able to trace out the
17 wire all the way back to the connector on
18 the control board.

19 Q. Okay. So I guess my
20 question is, not only did you have the
21 benefit of those Dr. Ferrese pictures,
22 but you yourself actually put your own
23 eyes on the evidence and traced out the
24 wiring as well, correct?

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1 A. Yes.

2 Q. Okay. You also had an
3 opportunity to examine the stovetop
4 range, correct?

5 A. Yes.

6 Q. Okay. And I understand in
7 reviewing the pictures that you took from
8 that evidence exam that you looked at the
9 wiring behind the control panel portion
10 of the GE stove; is that correct?

11 A. Yes.

12 Q. All right. Now, you also --
13 I think that was your second. I'm sorry,
14 that was the first conclusion from your
15 report that you were able to eliminate
16 the range, but I guess I want to ask you
17 how you can eliminate the range as a
18 potential cause for the fire. And then
19 the second question is, you know, if the
20 fire had started on the range, would you
21 expect to see electrical activity in the
22 area of the control panel where the
23 wiring for that control panel is located?

24 MR. VOTER: Objection.

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1 That's obviously a compound
2 question and it goes beyond the
3 scope of this witness's expertise.

4 MR. McGLYNN: No, I
5 certainly beg to differ, but I
6 will ask it in a non-compound way.

7 BY MR. McGLYNN:

8 Q. How can you eliminate the
9 range as a cause of the fire?

10 MR. VOTER: Objection; form
11 and foundation.

12 MR. McGLYNN: Sorry, you're
13 right.

14 BY MR. McGLYNN:

15 Q. How can you eliminate the
16 electrical components of the range as a
17 cause of the fire?

18 MR. VOTER: Thank you.

19 THE WITNESS: I was about to
20 make that clarification myself.
21 The electrical components did not
22 indicate any evidence of
23 electrical damage. They indicated
24 evidence that was consistent with

Christoph J. Flaherty, P.E.

1 fire attack. There was also no
2 electrical arcing identified. At
3 the time that the circuitry on the
4 range was burned, it was no longer
5 energized.

6 BY MR. McGLYNN:

7 Q. Okay. So if the fire had
8 started on the stovetop and the control
9 panel or range was energized, would you
10 have expected to see electrical activity
11 or arcing on the wiring that you
12 examined?

13 MR. VOTER: Object to the
14 form.

15 THE WITNESS: Yes, normally
16 I would expect that.

17 BY MR. McGLYNN:

18 Q. Okay. I want to direct you
19 to your Conclusion No. 4. "The observed
20 electrical arcing on the FD-HTR circuit
21 wire was either caused by fire attack or
22 by mechanical damage to the insulation of
23 the conductor."

24 Is that still your opinion

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1 within a reasonable degree of scientific
2 certainty?

3 A. Yes.

4 Q. Okay. And does the second
5 one -- I apologize. I'm just having a
6 hard time getting these out of the way.

7 The second line which is,
8 "No additional evidence was available
9 which would allow a determination that
10 either fire attack or mechanical damage
11 was the more likely cause of the
12 electrical failure in the FD-HTR
13 circuit," is that still your opinion
14 within a reasonable degree of scientific
15 certainty?

16 A. Yes.

17 Q. Okay. Now, Mr. Voter had
18 asked you questions about whether or not
19 their having a specific larger relay you
20 saw as well as the thermal protection
21 employed with this light bulb assembly.
22 Do you recall being asked a lot of
23 questions about those two items?

24 A. Yes.

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1 Q. Does the addition of a
2 thermal protector or the larger relay
3 cause you to eliminate the light bulb
4 assembly as a potential source of
5 ignition?

6 A. No, not completely.

7 Q. Okay. And can you
8 explain -- well, first of all, let me ask
9 you in your report, you did not -- you do
10 not contend that the -- it does not seem
11 to me like your opinion is that the relay
12 was defective, or do you have an opinion
13 on whether or not the particular relay
14 installed at the time of the fire was or
15 wasn't effective?

16 MR. VOTER: Effective or
17 defective?

18 MR. McGLYNN: I said
19 effective.

20 MR. VOTER: I object to the
21 question. Can I hear it again?

22 (Court reporter read back
23 the preceding question.)

24 MR. McGLYNN: So let me

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1 rephrase that.

2 BY MR. McGLYNN:

3 Q. Okay. Do you have an
4 opinion about whether or not the relay
5 that was installed that we've been
6 discussing at the time of the fire was
7 effective or not?

8 MR. VOTER: Object to the
9 form.

10 THE WITNESS: No.

11 BY MR. McGLYNN:

12 Q. Okay. Had the relay been
13 properly designed and installed, would
14 that cause you to eliminate the light
15 bulb assembly as a potential cause of
16 this fire?

17 A. No. I think you mentioned
18 other possibilities were how the light
19 might be illuminated without a defective
20 relay.

21 Q. Right. And I'm going to ask
22 you about that in a second, but the same
23 question goes for the thermal protection.
24 Does the fact that a thermal protection

Christoph J. Flaherty, P.E.

1 device existed or was found or recovered
2 among the evidence cause you to eliminate
3 that light bulb assembly as a potential
4 source of ignition in the top-third
5 compartment of the refrigerator?

6 A. No.

7 Q. Okay. And can you explain
8 why you cannot eliminate -- I mean, at
9 the risk of being redundant, why you
10 can't eliminate that light bulb assembly?

11 MR. VOTER: At the risk of
12 being what, Joe?

13 MR. McGLYNN: Redundant.

14 THE WITNESS: Well, we see
15 appliances with thermal protectors
16 cause fires with more regularity
17 than we would like. So I think in
18 my earlier answers to Mr. Voter's
19 questions, I often prefaced with
20 properly selected, properly
21 installed and not degraded
22 performance of any kind, which are
23 things that we can't rule out in
24 this instance.

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1 BY MR. McGLYNN:

2 Q. Okay. And just one example
3 may be thousands of Broan-NuTone fans
4 that were the subject of a recall. Have
5 you ever worked or examined any of those
6 Broan-NuTone fans?

7 MR. VOTER: Objection; form,
8 foundation, relevance.

9 THE WITNESS: I don't think
10 there has been any recall, but I
11 have looked at numerous bathroom
12 ventilation fans with thermal
13 protectors installed that have
14 failed and caused fires.

15 BY MR. McGLYNN:

16 Q. Okay. Have you ever seen
17 other appliances which have had a thermal
18 protection device that's failed and
19 caused a fire?

20 A. Yes.

21 Q. I should say an appliance
22 that caused a fire which nevertheless had
23 a thermal protection device installed in
24 it.

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1 MR. VOTER: Object to the
2 form and foundation.

3 THE WITNESS: Yes.

4 BY MR. McGLYNN:

5 Q. Okay. Is it fair to say
6 that most electrically powered products
7 on the market today have thermal
8 protection devices of some kind?

9 MR. VOTER: Objection.

10 THE WITNESS: I'm not sure
11 if I would say most. I guess that
12 kind of depends on -- yeah, the
13 question is a little bit too
14 broad. It kind of depends on what
15 we talked about, electrical
16 products, what levels of thermal
17 protection. Yeah, in the broader
18 sense, most, most electrical
19 products have some form of thermal
20 protection.

21 BY MR. McGLYNN:

22 Q. Are you asking me a question
23 now, C.J.?

24 A. No. I was just trying to

Christoph J. Flaherty, P.E.

1 think about the way that you had phrased
2 it. Yeah, I think that's accurate.

3 Q. That most electrically
4 powered products have a thermal
5 protection device installed?

6 A. Have some form of thermal
7 protection. I wouldn't necessarily
8 say -- you know, it depends on the type
9 of product, regarding the type of device
10 and all of those things, but yes.

11 Q. Okay. And I guess my next
12 question which you've already anticipated
13 was what causes you to be unable to --
14 why can't you eliminate the whole
15 assembly as a potential source of
16 ignition here?

17 MR. VOTER: Objection; asked
18 and answered.

19 THE WITNESS: Because of its
20 location and its capacity to
21 generate heat in that area and
22 because of the determination of
23 the fire origin in the area of the
24 top of the refrigerator.

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1 BY MR. McGLYNN:

2 Q. Okay. Your Conclusion No. 5
3 is, "Potential fire causes within the
4 area of fire origin inside the top of the
5 Ellis refrigerator are limited to failure
6 of the FD-HTR heater circuit insulation
7 due to mechanical damage sustained over
8 years of use or ignition of combustible
9 food storage containers close to, or in
10 contact with, the internal light fixture.
11 In either case, the fire was caused by a
12 defect within the refrigerator."

13 Do you still hold that
14 opinion within a reasonable degree of
15 engineering certainty?

16 A. Yes.

17 Q. Were you able to -- have
18 you -- in evaluating the evidence in this
19 case, have you evaluated -- have you
20 observed or identified any other
21 electrical sources, competent sources of
22 ignition that you weren't otherwise able
23 to eliminate as the cause of the fire?

24 A. No.

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1 Q. Does -- I'm going to ask you
2 the same question for any of these five
3 questions. For any of these five
4 conclusions -- I'm sorry.

5 Does the effectiveness of
6 the larger relay or thermal protection
7 device that was photographed by Mr.
8 Nemeth or Nemeth impact or cause you to
9 alter any of these five conclusions?

10 A. No.

11 MR. McGLYNN: I don't have
12 any other questions. Mr.
13 Flaherty, thank you.

14 - - -

15 EXAMINATION

16 - - -

17 BY MR. VOTER:

18 Q. Mr. Flaherty, am I correct
19 that your role was to assess potential
20 electrical causes of the fire?

21 A. Yes. I would qualify my
22 role as assess potential electrical
23 causes of the fire and opine as to which
24 potential fire causes are in the area of

Christoph J. Flaherty, P.E.

1 determined fire origin in the top portion
2 of the refrigerator.

3 Q. Okay. That's something you
4 understood at the time of the evidence
5 exam?

6 A. The aspect of analyze the
7 potential electrical fire causes was
8 certainly understood at the time, yes.
9 Yes.

10 Q. Okay. It was not your role
11 to assess nonelectrical causes of the
12 fire, correct?

13 A. Correct.

14 Q. I'm curious about your
15 testimony just now in response to Mr.
16 McGlynn's questions about the light bulb.
17 You said if the relay and the thermal
18 protector were properly selected,
19 properly installed -- excuse me. We were
20 talking only about the thermal protector.

21 You said if the thermal
22 protector was properly selected, properly
23 installed and not degraded, then it would
24 have prevented this fire, correct?

Christoph J. Flaherty, P.E.

1 A. Yes.

2 Q. And you have no
3 information --

4 A. I'm sorry. I need to modify
5 that answer. It would have prevented a
6 fire starting as a result of the bulb
7 overheating.

8 Q. Fair enough. You have no
9 information about whether its selection
10 was proper, correct?

11 A. Correct.

12 Q. You made no effort to find
13 out whether its selection was proper,
14 correct?

15 MR. McGLYNN: Well,
16 objection.

17 BY MR. VOTER:

18 Q. Okay. You can answer the
19 question.

20 A. I wasn't -- I made an
21 effort, but I wasn't able to determine
22 whether its selection was proper.

23 Q. What effort did you make?

24 A. To see what the expected

Christoph J. Flaherty, P.E.

1 temperatures were and to see what its
2 setpoint was.

3 Q. What did you do to try to
4 determine that?

5 A. I reviewed the LG
6 documentation.

7 Q. Oh, was the information in
8 there?

9 A. I saw the temperature
10 testing was in there, and I don't recall
11 the setpoint temperature, if it was in
12 there for the thermal protector.

13 Q. Did you ask Mr. McGlynn to
14 find out?

15 A. No.

16 Q. And since they were testing
17 refrigerators that didn't have thermal
18 protection, are you surprised that there
19 wasn't information about the thermal
20 protector in there?

21 MR. McGLYNN: Objection.

22 THE WITNESS: No.

23 BY MR. VOTER:

24 Q. Do you have any information

Christoph J. Flaherty, P.E.

1 that the thermal protector in the Ellis's
2 refrigerator was improperly installed?

3 A. No.

4 Q. Do you have any information
5 that the thermal protector installed in
6 the Ellis's refrigerator was degraded to
7 the point that it was not effective?

8 A. No.

9 MR. McGLYNN: Object.

10 BY MR. VOTER:

11 Q. Your Conclusion 5 says,
12 "Potential fire causes within the area of
13 fire origin inside the top of the Ellis
14 refrigerator are limited to failure of
15 the FD-HTR heater circuit insulation due
16 to mechanical damage sustained over years
17 of use." Do you recall saying that?

18 A. Yes.

19 Q. Does your report anywhere
20 say that it could have been because of
21 damage done to the harness during
22 installation?

23 MR. McGLYNN: Objection.

24 THE WITNESS: I don't think

Christoph J. Flaherty, P.E.

1 so.

2 BY MR. VOTER:

3 Q. So the only mention of a
4 mechanism of damage to the wiring harness
5 is mechanical damage sustained over years
6 of use --

7 MR. McGLYNN: Objection.

8 MR. VOTER: I didn't finish
9 my question.

10 BY MR. VOTER:

11 Q. Have you done any research
12 or made any effort to determine how a
13 refrigerator of this design could have
14 resulted in mechanical damage to the
15 wiring harness over years of use?

16 MR. McGLYNN: Objection.

17 THE WITNESS: Not separate
18 from reviewing the designs.

19 BY MR. VOTER:

20 Q. Which don't tell you how it
21 could have produced mechanical damage to
22 the wire harness, correct?

23 MR. McGLYNN: Object.

24 THE WITNESS: They indicate

Christoph J. Flaherty, P.E.

1 the potential for mechanical
2 damage based on the location of
3 the transition and the motion of
4 the hinge, but there is no
5 specific indication that it would
6 be.

7 BY MR. VOTER:

8 Q. And you never looked at an
9 exemplar to see whether there in fact
10 would be that problem, correct?

11 MR. McGLYNN: Objection.

12 THE WITNESS: That's right.

13 MR. VOTER: Okay. That's
14 all I have. Thank you.

15 MR. McGLYNN: All right. I
16 just have a couple follow-ups, Mr.
17 Flaherty.

18 - - -

19 EXAMINATION

20 - - -

21 BY MR. McGLYNN:

22 Q. Have you seen any LG
23 documents which would suggest that the
24 selection and installation of the wiring

Christoph J. Flaherty, P.E.

1 harness was appropriate for this
2 particular refrigerator?

3 MR. VOTER: Objection to
4 form.

5 THE WITNESS: I'm sorry.
6 Could you say that again? The
7 selection and installation of the
8 wiring harness?

9 BY MR. McGLYNN:

10 Q. Right. Do you understand
11 the question that I just asked?

12 A. I don't think I do.

13 Q. Okay. All right. I thought
14 I heard you say in answering Mr. Voter's
15 question that there is a few ways that
16 the wiring could fail; is that right?
17 Not the thermal protection and the wiring
18 harness. I'm just asking you about the
19 wiring harness now.

20 MR. VOTER: Is there a
21 question?

22 THE WITNESS: So are we
23 talking about a specific --

24 MR. McGLYNN: Thanks,

Christoph J. Flaherty, P.E.

1 Warren. If you have an objection,
2 raise it. Okay?

3 MR. VOTER: I'm waiting for
4 a question to make the objection,
5 but I didn't hear one.

6 MR. McGLYNN: Okay.

7 BY MR. McGLYNN:

8 Q. Have you received any
9 documents from LG which suggest that the
10 selection and installation and the
11 routing of the wiring harness for this
12 refrigerator was appropriate?

13 MR. VOTER: Object to the
14 form.

15 THE WITNESS: I see nothing
16 in the design documents to
17 indicate that it is inappropriate.

18 BY MR. McGLYNN:

19 Q. I didn't ask you that
20 question. I don't care about the design
21 documents. I want to know about all the
22 documents that you got in discovery in
23 this case. Did LG show you that the
24 routing, installation and selection of

Christoph J. Flaherty, P.E.

1 the wiring harness was appropriate? Did
2 they test it for this one? Have you seen
3 records showing that it was tested, that
4 there was some post-manufacture
5 inspection that was done? Do you know
6 whether someone actually saw how this
7 thing was installed or routed? Have you
8 seen any of those documents?

9 MR. VOTER: Objection;
10 compound question.

11 THE WITNESS: No.

12 BY MR. McGLYNN:

13 Q. Do you know whether or not
14 the plaintiff asked for those documents?

15 A. No.

16 Q. Can you tell me if the same
17 questions would apply to the thermal
18 protection device for this particular
19 light bulb assembly? Have you seen any
20 documents whatsoever from LG that show
21 that this thing, that the light bulb
22 assembly thermal protection device was
23 inspected, tested, looked at by anyone
24 after it was placed in this refrigerator?

Christoph J. Flaherty, P.E.

1 A. No.

2 Q. Do you know whether or not
3 the plaintiff had to ask for that?

4 A. No.

5 MR. McGLYNN: I don't have
6 any other questions.

7 - - -

8 EXAMINATION

9 - - -

10 BY MR. VOTER:

11 Q. Mr. Flaherty, did you review
12 the UL documents on this product?

13 A. Yes.

14 Q. And isn't the wiring and
15 electrical systems of the refrigerator
16 addressed in those documents and in the
17 standard?

18 MR. McGLYNN: Objection.

19 THE WITNESS: The UL
20 documents are generic I guess I
21 would qualify them as. UL
22 typically tests or examines an
23 exemplar of a product line and
24 then covers the whole host of

Christoph J. Flaherty, P.E.

1 available models under the same
2 examination or investigation. So
3 I do not have any high degree of
4 certainty that the specific UL
5 testings or examinations apply to
6 this specific refrigerator.

7 BY MR. VOTER:

8 Q. Well, you don't know either
9 way?

10 A. Yeah.

11 Q. You didn't even review the
12 whole thing, correct?

13 MR. McGLYNN: Objection.

14 BY MR. VOTER:

15 Q. Correct?

16 A. Correct.

17 MR. VOTER: Okay. I have no
18 other questions.

19 MR. McGLYNN: Okay.

20 MR. VOTER: All right.

21 (Witness excused.)

22 (Deposition concluded at
23 3:08 p.m.)

24

Christoph J. Flaherty, P.E.

CERTIFICATION

I, JARED E. BITTNER RPR and
NJ CSR License No. 30XI00235600, do
hereby certify that prior to the
commencement of the examination,
CHRISTOPH J. FLAHERTY, P.E., was duly
remotely sworn by me to testify to the
truth, the whole truth and nothing but
the truth.

I DO FURTHER CERTIFY that
the foregoing is a verbatim transcript of
the testimony as taken stenographically
by me at the time, place and on the date
hereinbefore set forth, to the best of my
ability.

I DO FURTHER CERTIFY that I
am neither a relative nor employee nor
attorney nor counsel of any of the
parties to this action, and that I am
neither a relative nor employee of such
attorney or counsel, and that I am not
financially interested in this action.



JARED E. BITTNER, RPR
NJ CSR No. 30XI00235600
Notary Public
Dated: January 7, 2021

Flaherty Engineering Investigation Report

By Christoph J. Flaherty, PE

November 6, 2020

Subject: Ellis Residence Fire
DOL: March 10, 2019
Flaherty Engineering Case 1505

1. Assignment

On January 24, 2020, I was asked to assist in investigating the fire which occurred on March 10, 2019 at the Ellis residence located at 54 Love Lane in Norwood, Pennsylvania. The purpose of the investigation was to assist and provide electrical engineering expertise to the fire origin and cause investigation being conducted by Mr. Robert Buckley of Robert Buckley Fire & Explosion Investigations.

2. Background

On March 10, 2019, a fire occurred in the kitchen of the Ellis residence at approximately 7 p.m. while the family was out. After the Norwood Fire Company extinguished the fire, Fire Chief Chris Givens conducted an investigation and determined that the fire originated inside the Ellis's refrigerator. Mr. Buckley and Mr. Frank Ferrese, PhD, PE of FJT Technologies, LLC conducted a scene inspection during which evidence was removed and retained as well as a destructive laboratory evidence examination prior to Flaherty Engineering's involvement. See Mr. Buckley's report under separate cover for a summary of his investigation and findings.

3. Investigation

The Flaherty Engineering investigation has included, but is not limited to:

1. Review of scene and evidence photographs taken by Mr. Frank Ferrese.
2. Review of the report of Mr. Robert Buckley dated November 2, 2020.
3. Examination of retained evidence on February 5, 2020.
4. Review of Ellis refrigerator documentation.
5. Review of documents associated with a light overheating issue in the subject refrigerator.
6. Review of the following deposition transcripts:
 - a. Mr. Thomas Ellis, taken on February 27, 2020;
 - b. Ms. Lisa Ellis, taken on February 27, 2020; and
 - c. Fire Chief Chris Givens, taken on March 6, 2020.

Additional discovery material may be produced and made available for analysis. Opinions expressed in this report may be amended and/or modified based on information revealed in any additional material produced.

3.1 Review of Ferrese Scene and Evidence Exam Photographs

Flaherty Engineering was provided with a 591-page pdf document consisting of copies of Dr. Ferrese's scene photographs and a 559-page pdf document consisting of copies of Dr. Ferrese's evidence exam photographs. Copies of photographs referred to in this report are included in Appendix A. Dr. Ferrese's scene photographs documented the location of the appliances and burn patterns in the kitchen, the status of the electrical distribution panel, and the removal of evidence. As the refrigerator was removed, the refrigerator power cord and the power cord for the gas range next to the refrigerator were depicted plugged into an undamaged duplex outlet behind the refrigerator (Photographs 1 & 2). As the range was removed, a green extension cord was depicted plugged into another undamaged duplex outlet located behind the range (Photograph 3). No cords were depicted plugged into the receptacle end of the extension cord. In the photographs depicting the removal of the refrigerator and the range, no fire damage was evident at or around the duplex outlets or on the power cords for the refrigerator or range. All branch circuit wiring depicted in the Ferrese scene photographs appeared intact.

In addition to fire damage around the refrigerator, the Ferrese scene photographs depicted severe fire damage to the top of the interior of the refrigerator. Portions of a wiring harness were visible extending from the back right rear corner near the top of the refrigerator across the interior back and top of the refrigerator to the left front corner of the top of the refrigerator (Photographs 4 & 5). The metal portions of the interior light housing were also visible in the photographs.

Dr. Ferrese's evidence exam photographs depicted the inspection of the refrigerator and the removal of the wiring harness. These photographs more clearly documented the location and routing of the wiring harness prior to its removal (Photographs 6-8). After the removal of the wiring harness, Dr. Ferrese's photographs depicted arcing on some of its conductors (Photographs 9-11).

Dr. Ferrese's photographs also documented the condition of the range and its wiring. The range's control display and wiring were fire-damaged with the most severe damage occurring on the left side of the range (the side adjacent to the refrigerator) and damage becoming progressively less severe towards the right side (Photographs 12-15). No evidence

of electrical arcing or other electrical failure separate from damage caused by fire attack was noted. The range power cord appeared to be undamaged.

3.2 Report of Mr. Robert Buckley

Mr. Robert Buckley of Robert Buckley Fire & Explosion Investigations conducted a fire origin and cause investigation and issued a report summarizing his investigation and findings on November 2, 2020. In his report, Mr. Buckley documented interviews he conducted with Mr. and Mrs. Ellis during which they reported that they did not use either of the two ranges in the kitchen on the day of the fire and that the range located next to the refrigerator was only used for special occasions requiring extra cooking capacity. The last use of the range next to the refrigerator was over two months before the fire.

In his report, Mr. Buckley summarized his use of primarily fire pattern and fire dynamics analysis to determine that the fire originated inside the refrigerator. Mr. Buckley specifically ruled out fire origins on the stove or at the rear of the stove or refrigerator. See Mr. Buckley's report for more detailed discussion regarding fire origin determination.

3.3 Evidence Examination

An examination of the retained evidence was conducted on February 5, 2020 at Evidence Management Center's facility in Wilmington, Delaware. Observations noted from Dr. Ferrese's photographs above were confirmed, namely that damage to the range wiring decreased in severity from the left to the right (Photographs 16 & 17), most damage occurred in the top or the refrigerator interior (Photographs 18 & 19), and that there was electrical arcing on the internal wiring recovered from the top of the refrigerator (Photographs 20-23). The arced conductors were traced and determined to be: a brown-insulated conductor (tagged with number 18) which came from a connector attached to the main control board with the corresponding pin marked "FD-HTR" (Photographs 24 & 25); and a blue-insulated conductor (tagged number 17) which could not be traced back to a specific connector but which corresponded to the color generally used for neutral conductors in this refrigerator (Photograph 26). Based on the location of the arcing on the wires and the routing of the wiring harnesses in which the conductors were run, the electrical failure occurred in the left forward quadrant of the top of the refrigerator, near the left door hinge (Photographs 27 & 28).

The power cords of both the refrigerator and range, as well as the green extension cord recovered from behind the range, were inspected. The power cords were undamaged by the fire. The green extension cord which, although plugged in, appeared to be unused, had a section

of approximately 6 inches where the insulation was burned away, but no evidence of electrical activity was found.

3.4 Ellis Refrigerator Documentation

The receipt for the subject refrigerator identified it as a Kenmore-branded model 79577562600 with serial number 707KR00296 which was purchased on February 15, 2008. Based on the serial number, the refrigerator was manufactured in Korea in July of 2007. The refrigerator Use & Care Guide and Service Manual were reviewed and revealed that in the area of the identified electrical failure the refrigerator had a water filter, the internal light fixture, and the wiring harness transition from inside the refrigerator to the upper left door hinge for supply to components in the left door. The Service Manual showed that the refrigerator was supplied with one type of main printed circuit board (PCB) through July, 2007 (designated 6871JB1431) and a second type of main PCB from August, 2007 (designated EBR34917102). On both versions of the circuit board, the connector for the wiring harness containing the arced, brown-insulated wire was designated "CON2". A wiring diagram in the Service Manual showed that the brown-insulated conductor from CON2 supplied the "FRONT HEATER", the "R-DOOR HEATER", and the "L-DOOR HEATER". The wiring diagram also showed that blue-insulated conductors are normally used to serve the neutral conductor function, providing the electrical return path to complete the associated circuits.

3.5 LG Light Overheating Issue

Confidential documents provided by LG summarized their testing and analysis of an identified light overheating issue in this model of refrigerator and others manufactured starting in 2006. During their investigation, LG determined that the relay controlling the interior refrigerator light could stick shut, thus causing the light to remain on for an extended time, even with the doors shut. LG conducted testing which showed that the plastic components of the light fixture could overheat and melt in these circumstances. The LG testing did not result in the ignition of fires, but they neglected to test with combustible food storage containers placed near the light, as would be expected during normal use.

LG implemented a number of corrective measures to prevent the overheating issue, first changing the lens cover material and the light housing material before adding thermal protection and finally changing the light control relay to a larger model that would be less susceptible to sticking. The Ellis's refrigerator was manufactured without thermal protection and with the original relay. On February 1, 2009, LG issued Service Flash SF46-520R2 which

had technicians replace the older main PCB (with the smaller light control relay) with a newer version which included the larger relay. The Service Flash did not install thermal protection. Records of Service Repair Orders conducted on the Ellis's refrigerator included a line-item for the completion of SF46-520 on February 28, 2009.

4. Discussion

All potential electrical failures external to the refrigerator were eliminated as possible fire causes. Potential failures considered included failures of the power cords of either the refrigerator or range, failure of the green extension cord behind the range, failure of the house branch circuit wiring or outlets, and failure of the range's electronics or internal wiring. In the case of the power cords and the house wiring and outlets their elimination was based on the lack of damage to them. In the case of the green extension cord and the range wiring and electronics, their elimination was based on them showing evidence of fire damage consistent with their location without evidence of electrical failure.

The location of the electrical arcing identified on the FD-HTR circuit in the left forward quadrant of the top to the refrigerator in the area of the top left door hinge (Photographs 27 & 28) is consistent with a fire starting in the front of the top part of the refrigerator. If a fire had started in the back or towards the right side of the refrigerator, the wiring harness should have first been compromised and failed closer to those areas based on how it was routed (Photograph 29). The observed location of the electrical failure in the top left forward corner of the refrigerator provides arc-mapping substantiation of Mr. Buckley's elimination of the stove-top as a potential area of fire origin and his determination that the fire originated in the top of the refrigerator. The observed electrical arcing on the FD-HTR circuit wire was either caused by fire attack or by mechanical damage to the insulation of the conductor.

The fire starting at the top front of the refrigerator as a result of combustible food storage items coming into contact with an overheating light fixture explains the observed arcing and fire patterns. Although review of the service records and the configuration of the main PCB of the Ellis's refrigerator confirm that the corrective Service Flash had been performed on it, the potential of a fire starting as the result of the light remaining 'on' for an extended time with combustible food storage containers in contact with it cannot be discounted since the Ellis refrigerator lacked the thermal protection which would have de-energized an overheating light.

Potential fire causes within the area of fire origin inside the top of the Ellis refrigerator are limited to failure of the FD-HTR heater circuit insulation due to mechanical damage

sustained over years of use or ignition of combustible food storage containers close to, or in contact with, the internal light fixture. In either case, the fire was caused by a defect within the refrigerator which led to the insulation damage or to the light becoming hot enough to ignite adjacent combustible material. Abnormal use or abuse of the refrigerator were eliminated as contributing to the possible fire causes since there was no evidence observed which indicated the potential for abnormal use or abuse. Since the wiring harness is not accessible to the customer and should have been sufficiently well-protected from mechanical damage if it had been designed and manufactured properly, any mechanical damage it sustained was due to a defect in the refrigerator at the time of manufacture.

5. Conclusions

Based on my investigation, I have concluded, to a reasonable degree of engineering certainty, that:

1. All potential electrical failures external to the refrigerator in the Ellis residence were eliminated as possible fire causes. Potential failures considered included failures of the power cords of either the refrigerator or range, failure of the green extension cord behind the range, failure of the house branch circuit wiring or outlets, and failure of the range's electronics or internal wiring.
2. The location of the electrical arcing identified on the FD-HTR circuit in the left forward quadrant of the top to the refrigerator is consistent with a fire starting in the front of the top part of the refrigerator.
3. The observed location of the electrical failure in the top left forward corner of the refrigerator provides arc-mapping substantiation to Mr. Buckley's elimination of the stove-top as a potential area of fire origin and his determination that the fire originated in the top of the refrigerator.
4. The observed electrical arcing on the FD-HTR circuit wire was either caused by fire attack or by mechanical damage to the insulation of the conductor. No additional evidence was available which would allow a determination that either fire attack or mechanical damage was the more likely cause of the electrical failure in the FD-HTR circuit.
5. Potential fire causes within the area of fire origin inside the top of the Ellis refrigerator are limited to failure of the FD-HTR heater circuit insulation due to mechanical damage sustained over years of use or ignition of combustible food storage containers close to, or in contact with, the internal light fixture. In either case, the fire was caused by a defect within the refrigerator.

This report and the opinions expressed herein are based on the currently available information and are subject to amendment and modification should additional information become available.

Submitted by:



Christoph J. Flaherty, P.E.
Electrical Engineer

Appendix A

Report Photographs

FEC Case No.: 1505 | A-2
Ellis Residence Fire

Photograph 1

(Ferrese Scene Photo 384)



Area of fire in Ellis kitchen

Photograph 2

(Ferrese Scene Photo 414)



Refrigerator and range power cords

Photograph 3

(Ferrese Scene Photo 467)



Unused green extension cord plugged in behind range

Photograph 4

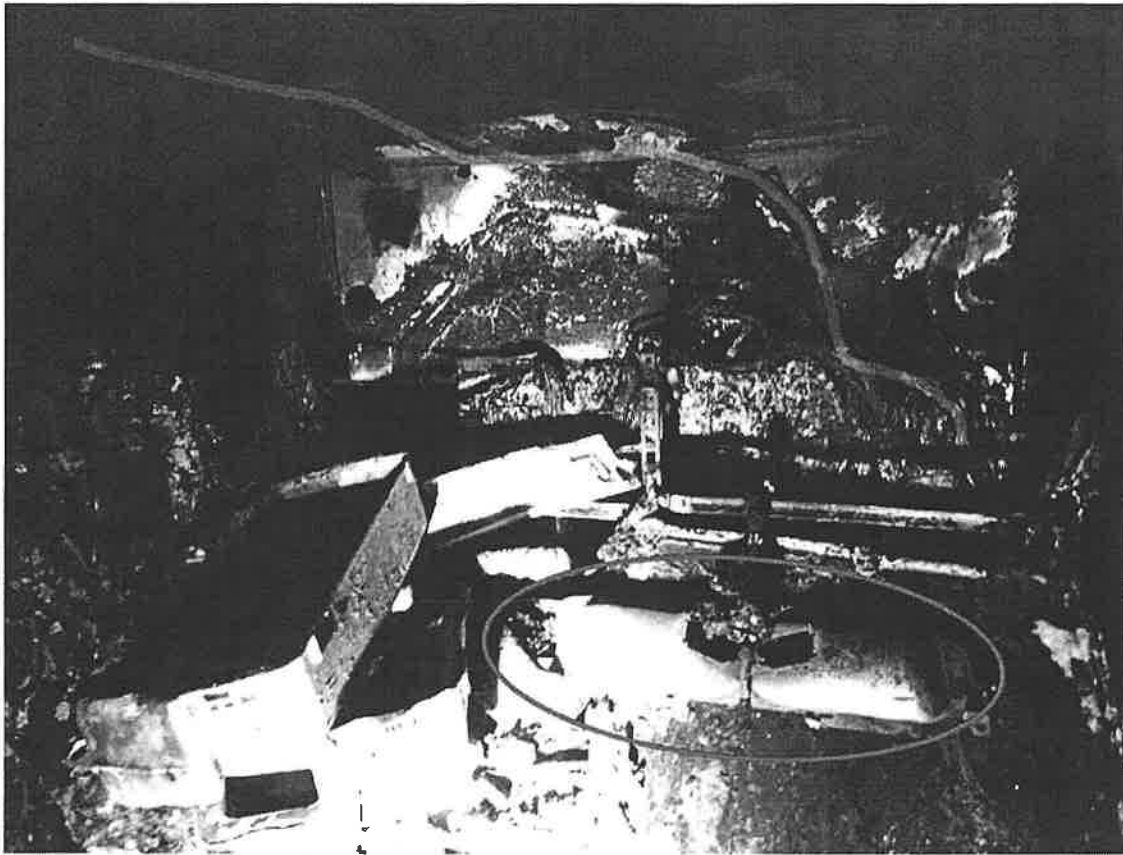
(Ferrese Scene Photo 127)



Refrigerator interior

Photograph 5

(Ferrese Scene Photo 136)

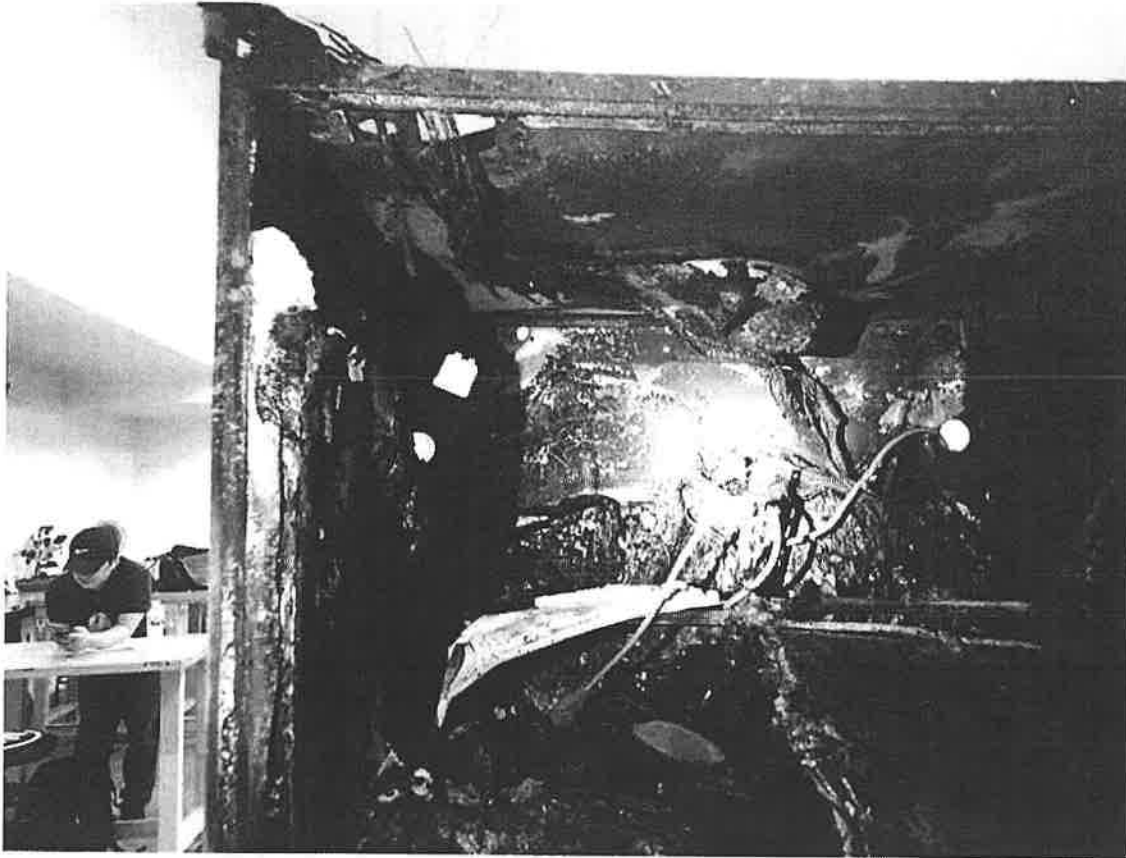


Refrigerator interior, path of wiring harness and light fixture remnant indicated

FEC Case No.: 1505 | A-7
Ellis Residence Fire

Photograph 6

(Ferrese Exam Photo 57)



Routing of wiring harness

Photograph 7

(Ferrese Exam Photo 95)



Routing of wiring harness

Photograph 8

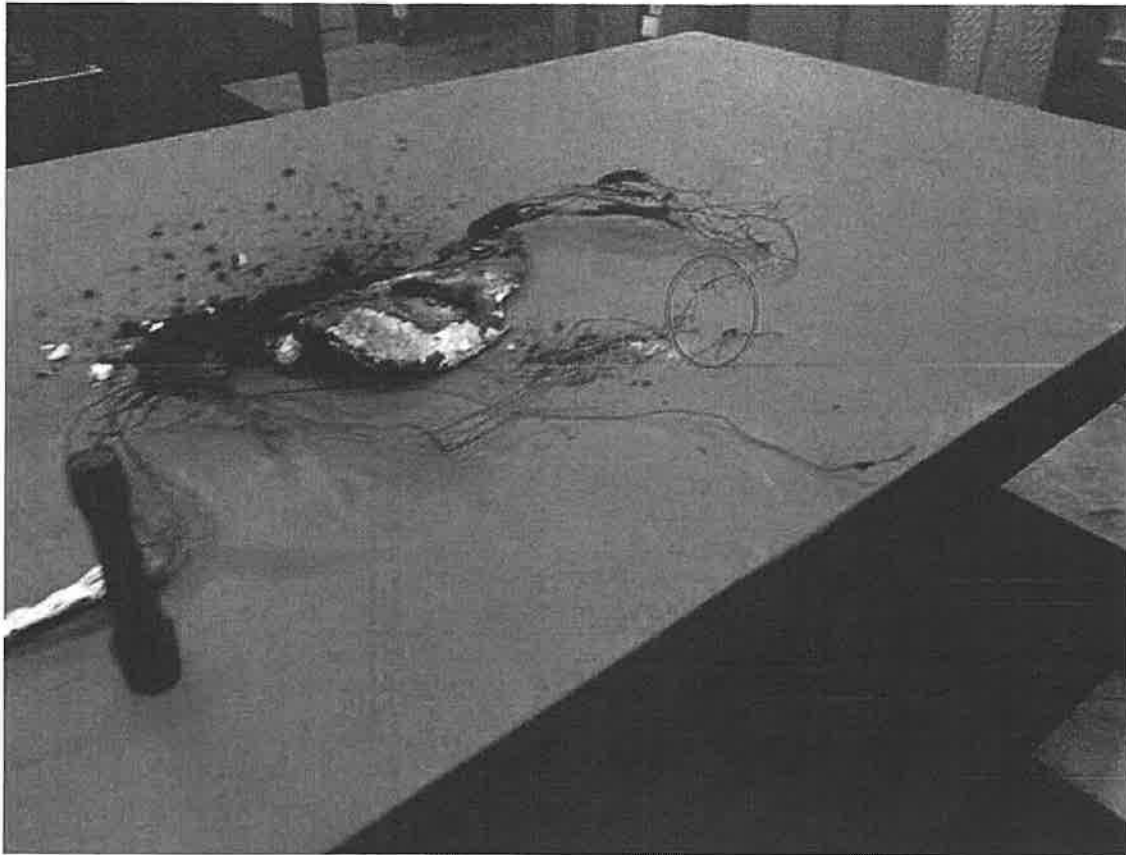
(Ferrese Exam Photo 98)



Routing of wiring harness

Photograph 9

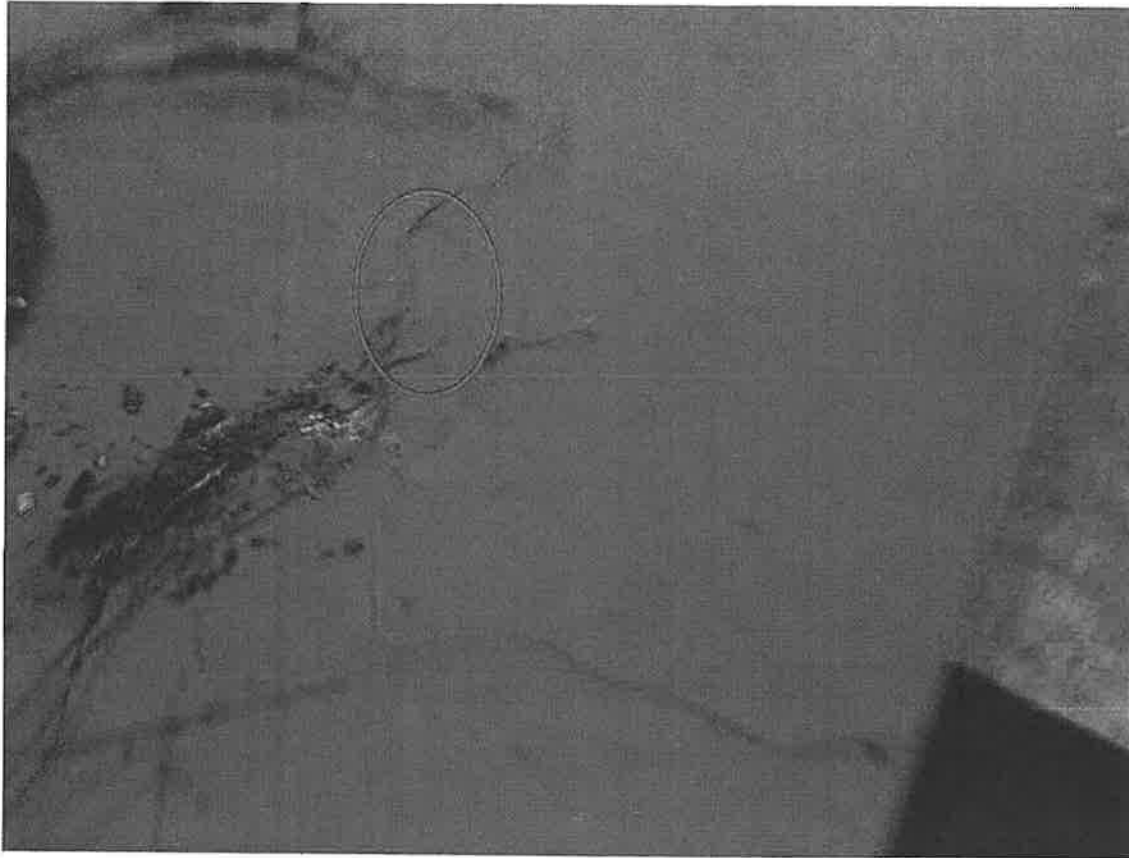
(Ferrese Exam Photo 177)



Examination of wiring harness, area of arcing indicated

Photograph 10

(Ferrese Exam Photo 180)



Examination of wiring harness, area of arcing indicated

10-1-21

FEC Case No.: 1505 | A-12
Ellis Residence Fire

Photograph 11

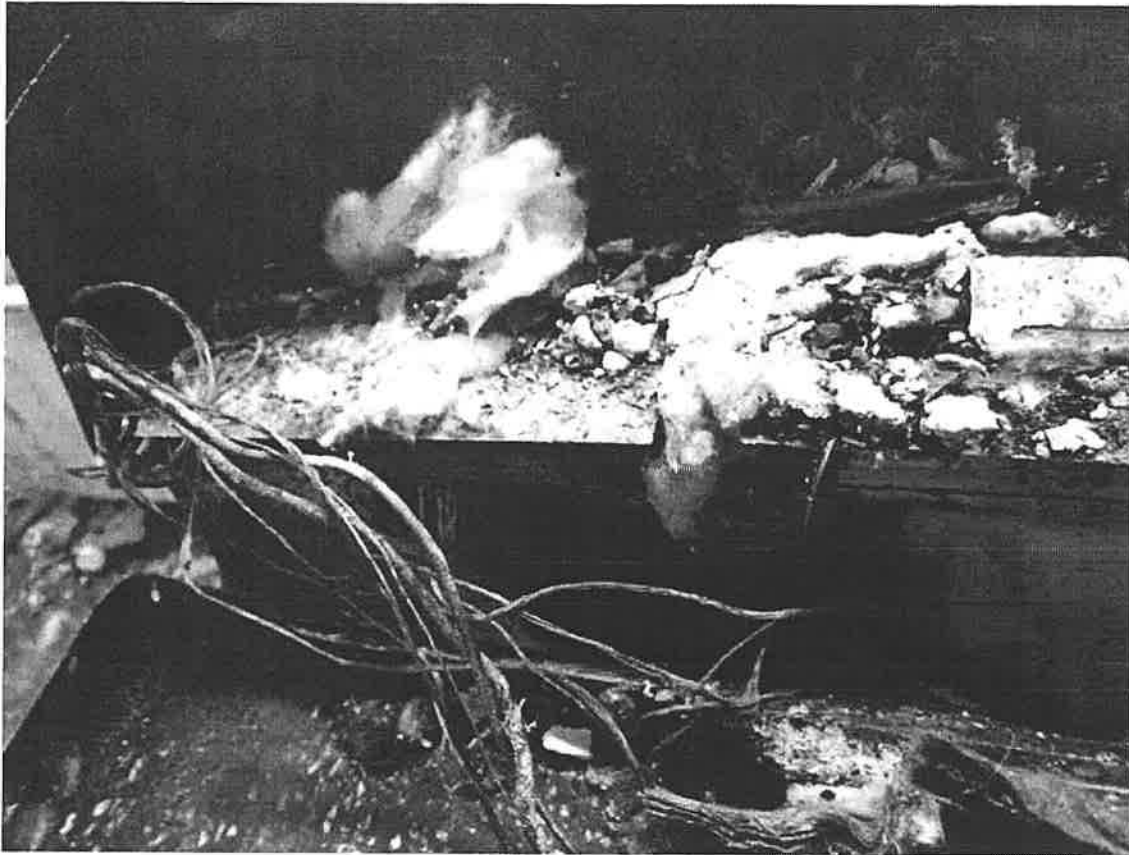
(Ferrese Exam Photo 185)



Arcing on wiring harness conductor

Photograph 12

(Ferrese Exam Photo 407)



Range control wiring, left side

Photograph 13

(Ferrese Exam Photo 403)



Range control/display board, left side

Photograph 14

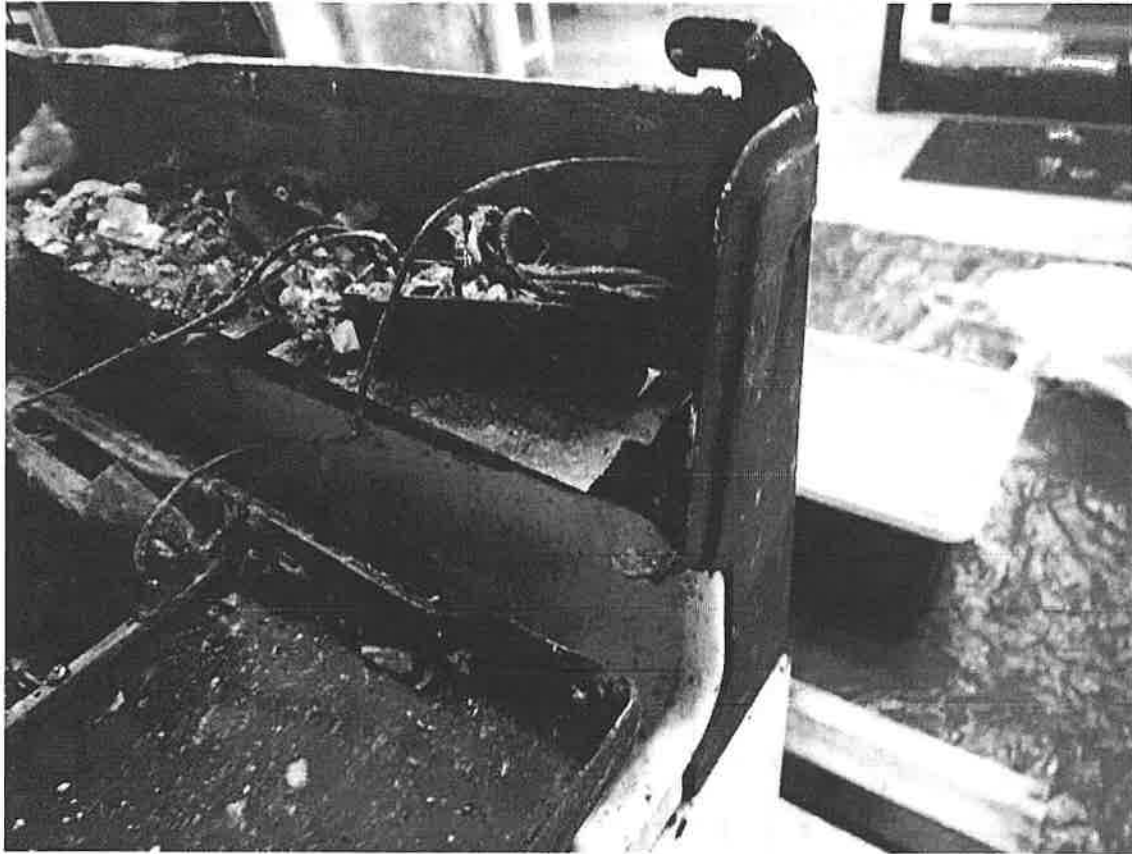
(Ferrese Exam Photo 400)



Range control/display board, right side

Photograph 15

(Ferrese Exam Photo 397)



Range control wiring, right side

Photograph 16

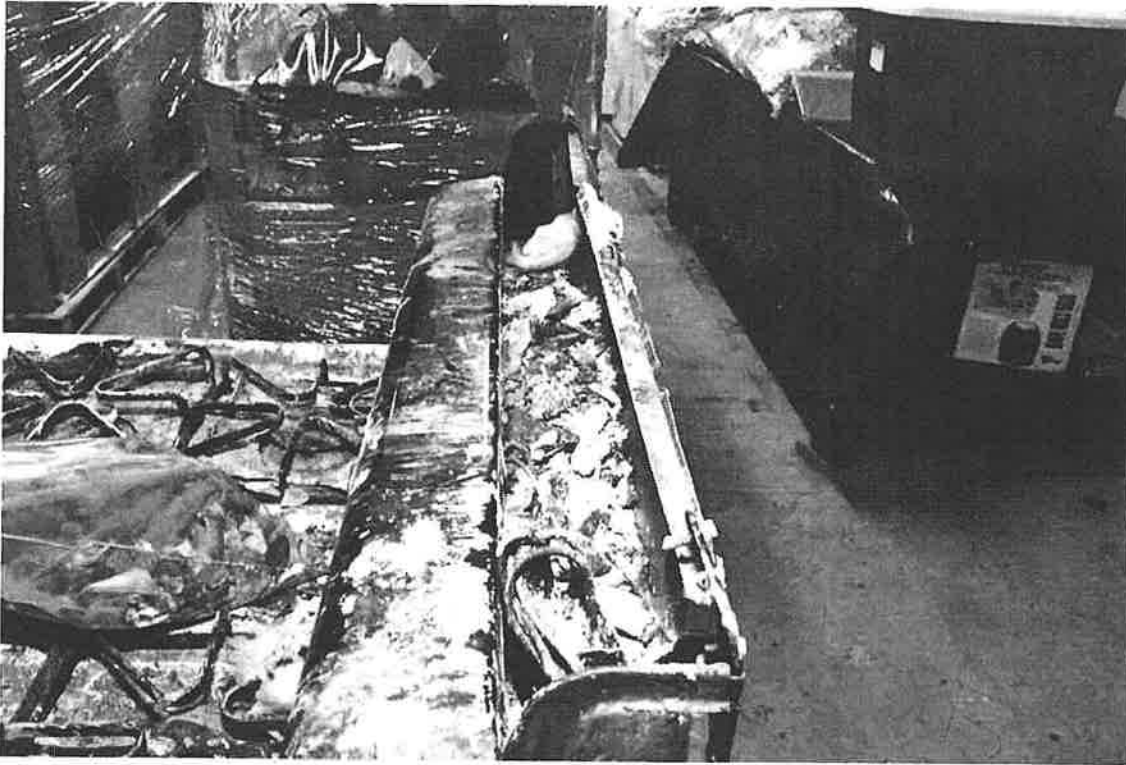
(Case Photo 47)



Damage to range

Photograph 17

(Case Photo 44)

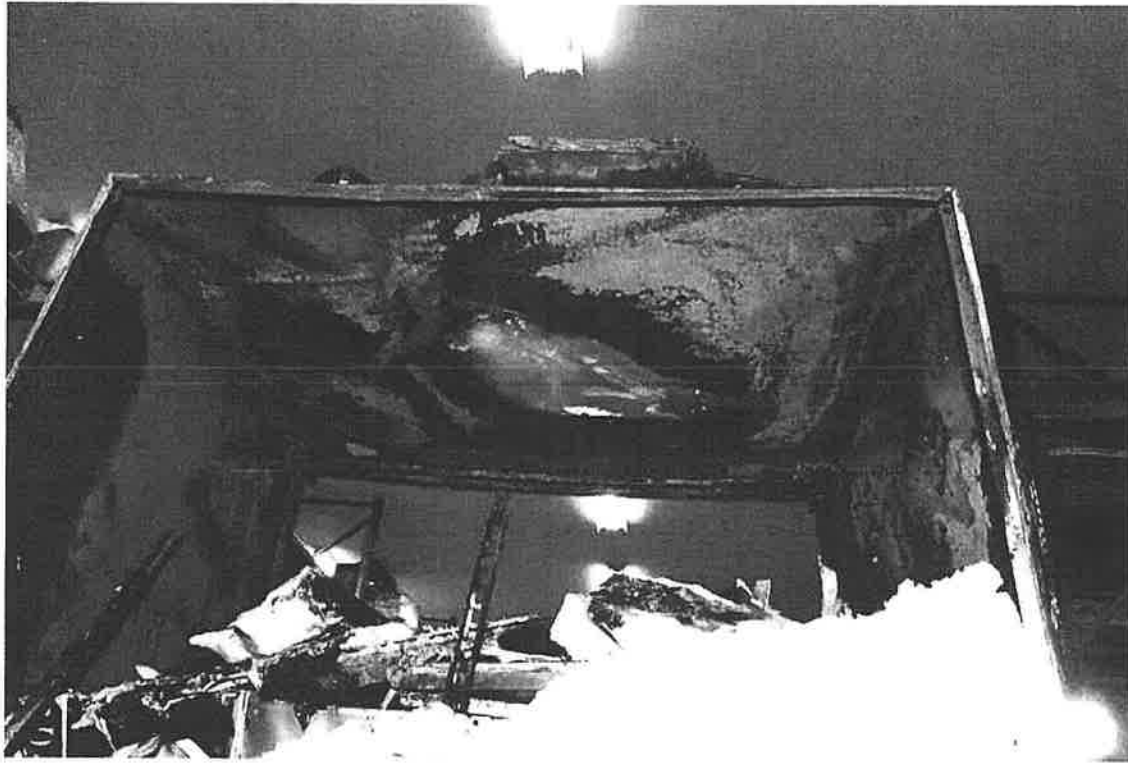


Damage to range

FEC Case No.: 1505 | A-19
Ellis Residence Fire

Photograph 18

(Case Photo 352)



Refrigerator damage

FEC Case No.: 1505 A-20
Ellis Residence Fire

Photograph 19

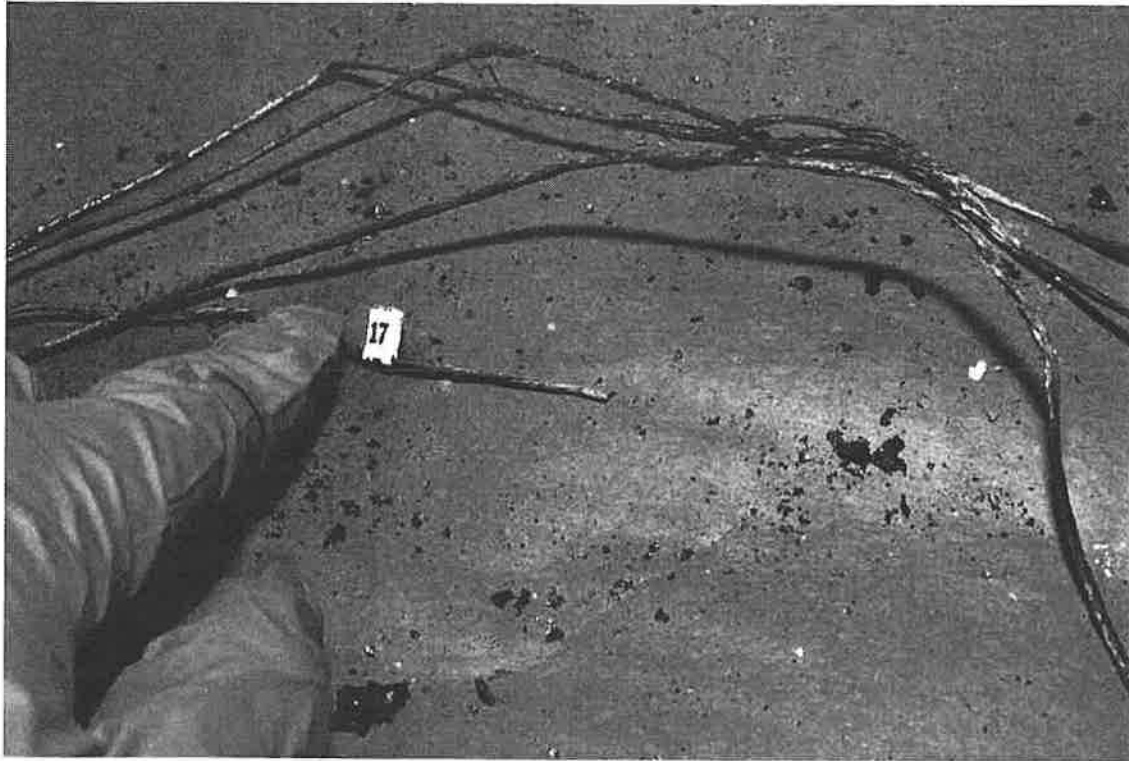
(Case Photo 373)



Refrigerator damage

Photograph 20

(Case Photo 285)



Arcing on refrigerator wiring harness conductors

FEC Case No.: 1505 | A-22
Ellis Residence Fire

Photograph 21

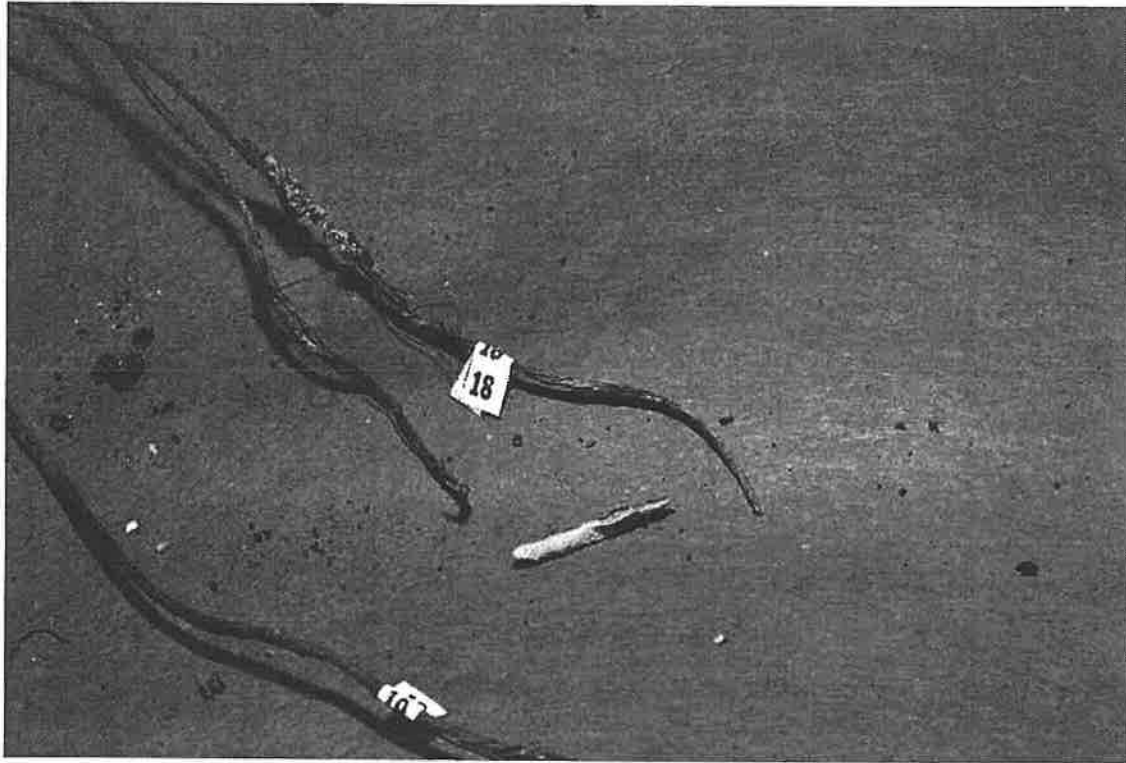
(Case Photo 292)



Arcing on refrigerator wiring harness conductors

Photograph 22

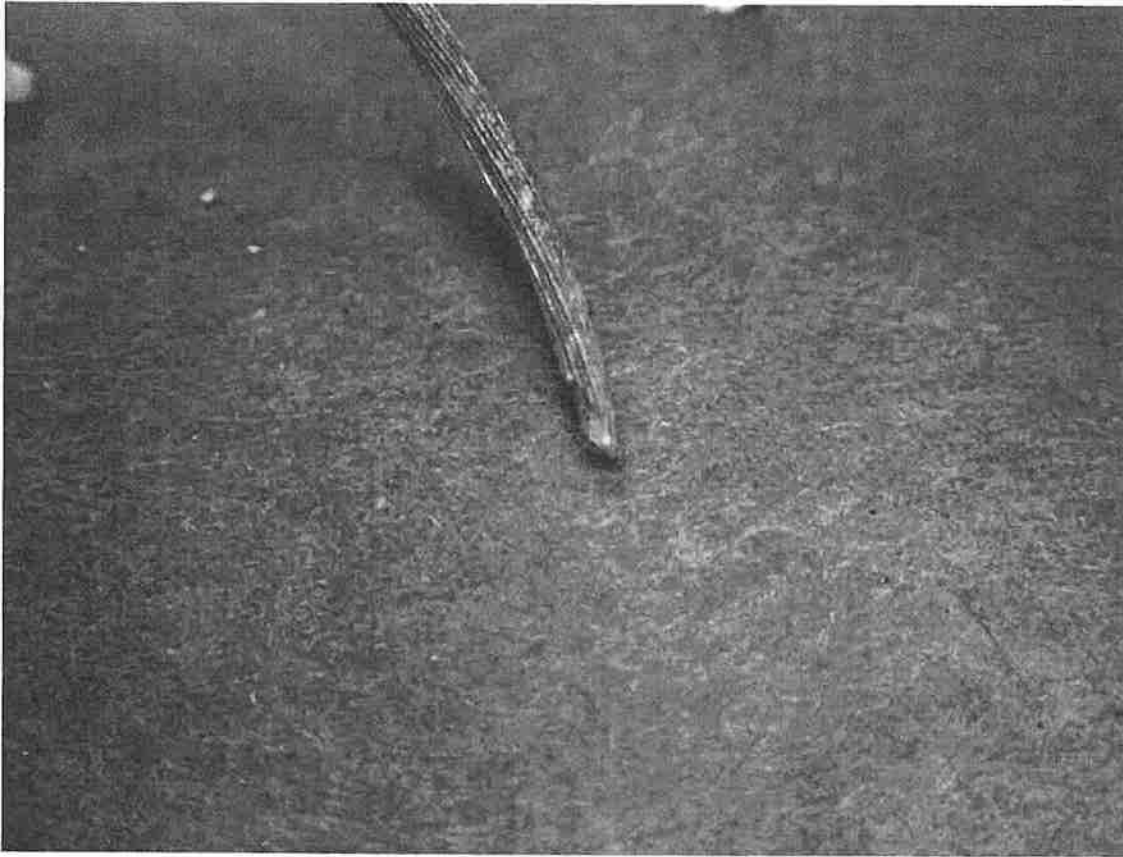
(Case Photo 288)



Arcing on refrigerator wiring harness conductors

Photograph 23

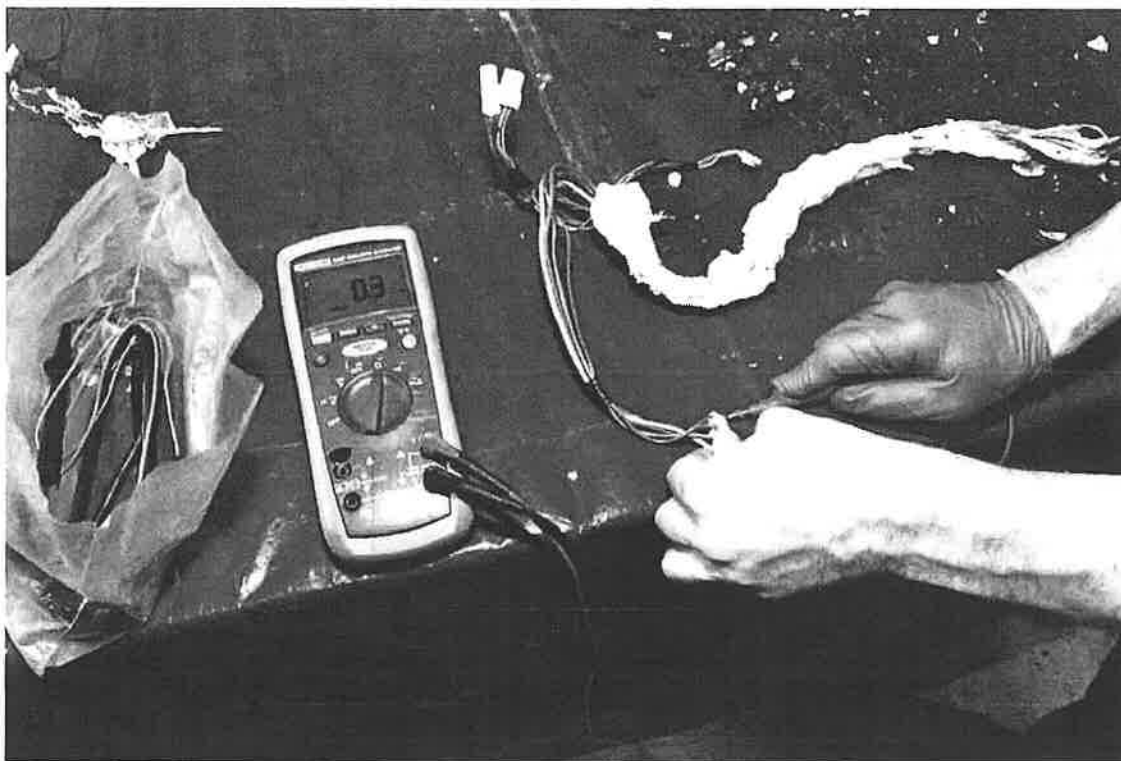
(Case Photo 294)



Arcing on refrigerator wiring harness conductors

Photograph 24

(Case Photo 401)

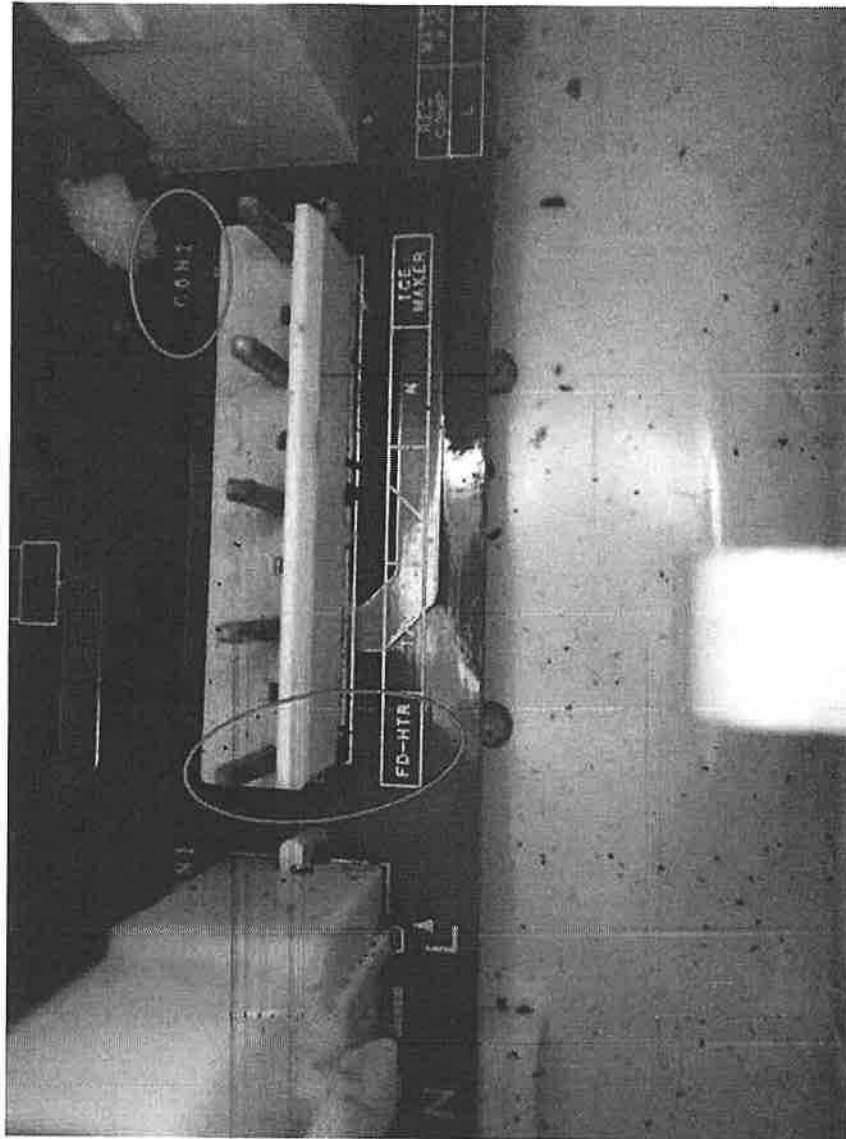


Tracing arced wire to brown conductor on connector "CON2"

FEC Case No.: 1505 A-26
Ellis Residence Fire

Photograph 25

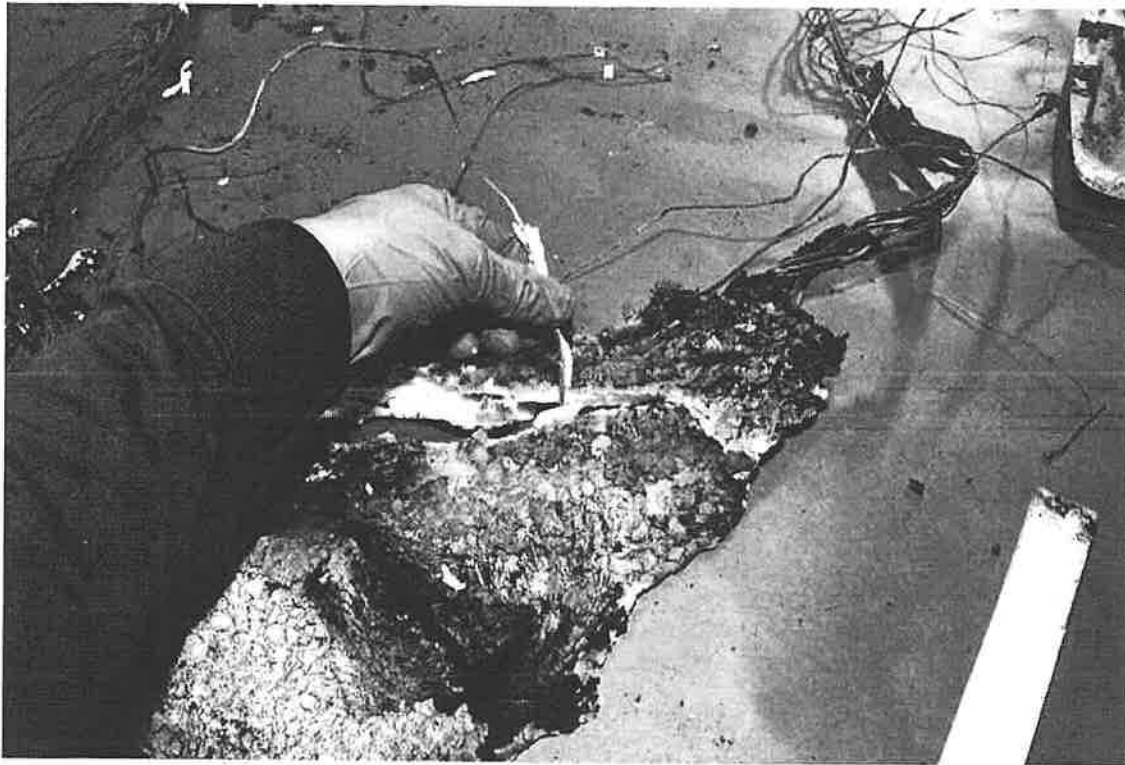
(Case Photo 406)



Arced wire traced to pin marked "FD-HTR"

Photograph 26

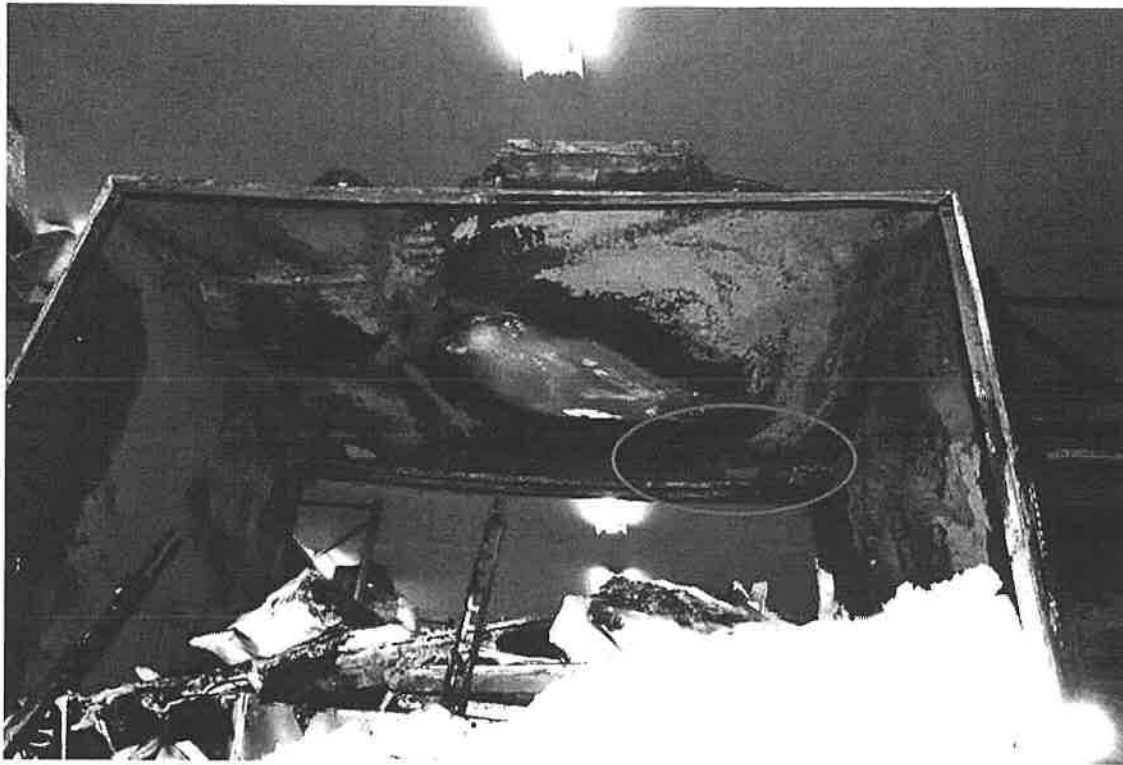
(Case Photo 412)



Tracing arced wire

Photograph 27

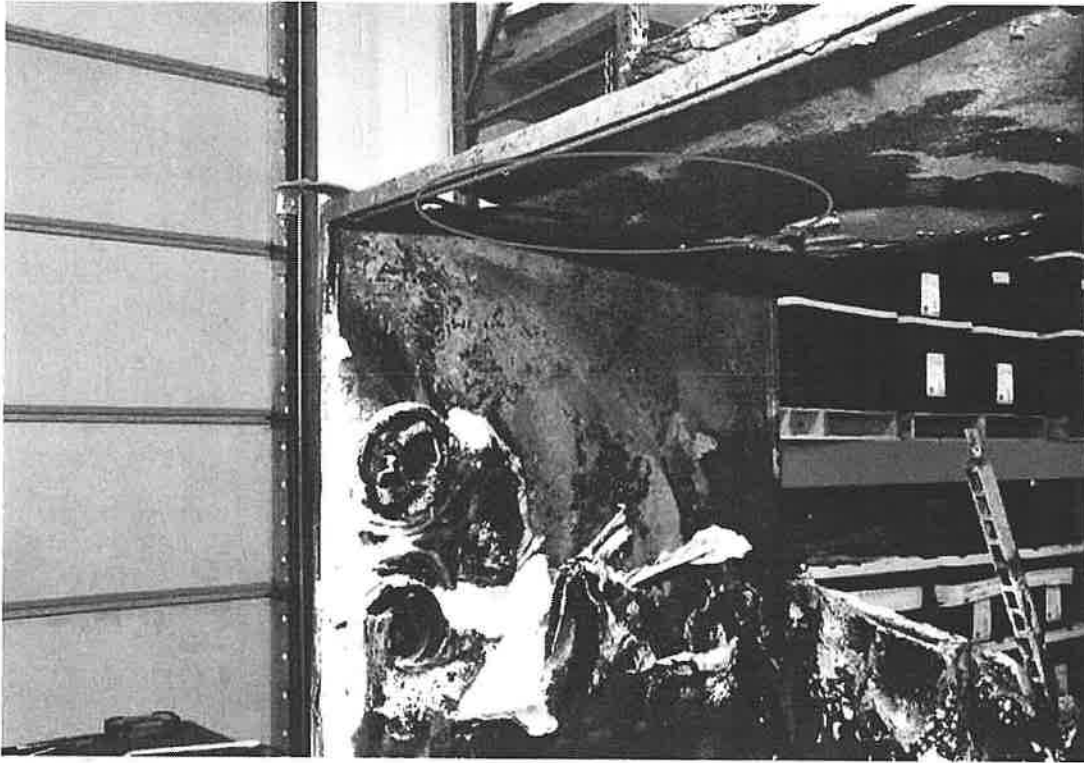
(Case Photo 352)



Area of wiring harness electrical failure (seen from back of refrigerator)

Photograph 28

(Case Photo 383)



Area of wiring harness electrical failure

Photograph 29

(Ferrese Scene Photo 384)



Routing of wiring harness and location of failure indicated on scene photo

Flaherty Engineering Consulting

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Academic Background

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2004

Registration and Qualifications

Licensed Professional Engineer in Maryland, Virginia, Pennsylvania, and the District of Columbia

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Professional Experience

Senior Electrical Engineer, Flaherty Engineering Consulting, LLC, 2009-present

Consulting Electrical Engineer, FORCON International, 2012-present

Consulting Electrical Engineer, Rothfuss Engineering Company, 2014-2019

Consulting Electrical Engineer, RTI Forsensics, 2013-2019

Electrical Engineering Faculty, United States Naval Academy, 2006-2012

Courses/subjects taught: Electrical Circuits, Power Generation and Distribution, Electrical
Motors, Power Supply Design, Fiber Optical Communications, Signals and Systems

Consulting Electrical Engineer, CED Investigative Technologies, Inc., 2006-2012

Senior Electrical Engineer, CED Investigative Technologies, Inc., 2003-2005

Optical Engineer/Laser Safety Officer, Lumera, Inc., 2001-2003

Nuclear Propulsion Plant Engineering Instructor, Trident Training Facility, 1999-2001

Strategic Missile Officer and Quality Assurance Director, USS Florida (SSBN 728), 1997-1999

Shift Maintenance Coordinator and Engineering Watch Officer, USS Florida (SSBN 728), 1996-1999

Naval Nuclear Propulsion and Submarine Training, United States Navy, 1994-1995

Professional Societies

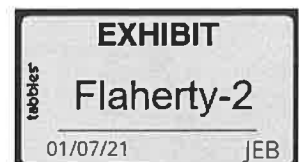
Institute of Electrical and Electronics Engineers (IEEE)

National Fire Protection Association (NFPA)

National Association of Fire Investigators (NAFI)

Areas of Expertise

- Electrical consumer products including appliances, tools, computers, extension cords, and surge protectors
- Electrically ignited fires
- Electrical grounding and electrical shock
- Electrical commercial and industrial equipment including electric motor operated pumps, fans, and HVAC units
- Electrical power generation and distribution, including switchgear design, installation, and maintenance
- Residential and commercial building wiring
- Electrical control systems
- Conduct of work on electrical systems, including lockout/tagout procedures and other OSHA requirements



Flaherty Engineering Consulting

2020 RATES AND POLICIES

Christoph Flaherty's 2020 consulting rate is \$290/hr for all standard services including travel, inspection, research, document review, and testimony. This rate also includes use of standard investigation and testing tools (digital photography and videography, measurement and power tools). Work in potentially asbestos-contaminated environments (which Christoph Flaherty is certified to do) will be billed at \$345/hr. Additional fees, such as those for use of specialized equipment and laboratory space, will be agreed upon and billed at cost.

All expenses incurred for travel (such as air fare, car rental, lodging, meals, tolls, and parking) will be billed at cost. Personal vehicle travel is billed at the government reimbursable rate (currently \$0.575/mile).

Evidence storage is also offered and billed according to size and nature of evidence. Storage rates generally range from \$25 to \$100 per month.

Expert Testimony Given by Christoph J. Flaherty, P.E.

Date	Case and Court	Attorney Client	On Behalf Of
12/10/2003 Deposition	Jeffery Johnston and Filomena Piccolino Johnston v. The Narragansett Electric Company, et al. v. L.M.A.C., LLC	Paul V. Reynolds	L.M.A.C, LLC
5/20/2004 Deposition	Erik Kwakwyei v. The Variety Mart, Inc., et al. in the Circuit Court of the City of Alexandria (CL030303)	R. Craig Jennings	Erik Kwakwyei
6/1/2004 Deposition	Geoffrey Manifold v. Wolf Coach, Inc., et al., v. James E. Forner, et al. in the U.S. District Court for the District of the District of Columbia (1:1CV01114 and 1:02CV01153)	Brian E. Hoffman	Wolf Coach, Inc.
9/14/2004 Deposition	PAS-Com, Inc. v. Allied Products, Inc., et al. in the Circuit Court for Montgomery County, Maryland (241709-V)	Walter L. Williams	Applica Durable Manufacturing, Ltd.
4/5/2005 Deposition	Hartford Insurance Company of the Midwest, subrogee of Tabor Auto Service v. Belkin-Components, et al.	Daniel J. Hart	Belkin Components
12/8/2005 Deposition	Allstate Insurance Company, subrogee of Daniel Tam v. A. O. Smith Corporation, et al. in the Circuit Court for Montgomery County (259865V)	Winn Friddell	Allstate Insurance
7/7/2006 Deposition	Walter Wilson v. Washington Metropolitan Area Transit Authority in th U.S. District Court for the District of the District of Columbia (1:03CV01931)	Allen Hilliard Legum	Walter Wilson
12/1/2006 Deposition	Larry Dean Murphy v. Astorg Ford & Hunter Engineering Co. in the Circuit Court of Wood County, West Virginia (05-C-88)	Susan Curry Brasselle	Larry Dean Murphy
12/13/2006 Deposition	Hartford Fire Insurance Co., subrogee of Simsbury Pediatric & Adolescent Dentistry v. AFP Imaging Corp., Dent-X International, & Sullivan-Schein Dental Sales & Services in the U.S. District Court for the District of Connecticut (3:05CV01019)	Jeffrey C. Pingpank	Sullivan-Schein Dental Sales & Services
1/23/2007 Deposition	Security Square Associates, et al. v. Richard Wood, et al. in the Circuit Court for Baltimore County (C-04-12745)	William N. Zifchak	Dennis Dodsworth
3/30/2007 Deposition	Allstate Insurance Company, subrogee of Quinton Wilson v. Kolb Electric, Inc. in the Circuit Court for Prince George's County (CAL06-08082)	Charles Fratus	Allstate Insurance
5/16/2007 Trial	Kendra Brooks, et al. v. District of Columbia Housing Authority in the Superior Court of the District of Columbia (CA No. 05-0654)	Michael Hicks and Dawn Singleton	DC Housing Authority
6/11/2007 Deposition	Betty Bell, et al. v. Zenith Electronics Corporation, et al. in the Circuit Court for Baltimore County (03-C-05-010401)	Dan Lanier and Steve Kelly	Circuit City

EXHIBIT

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Flaherty Testimony, Cont. (Page 2)

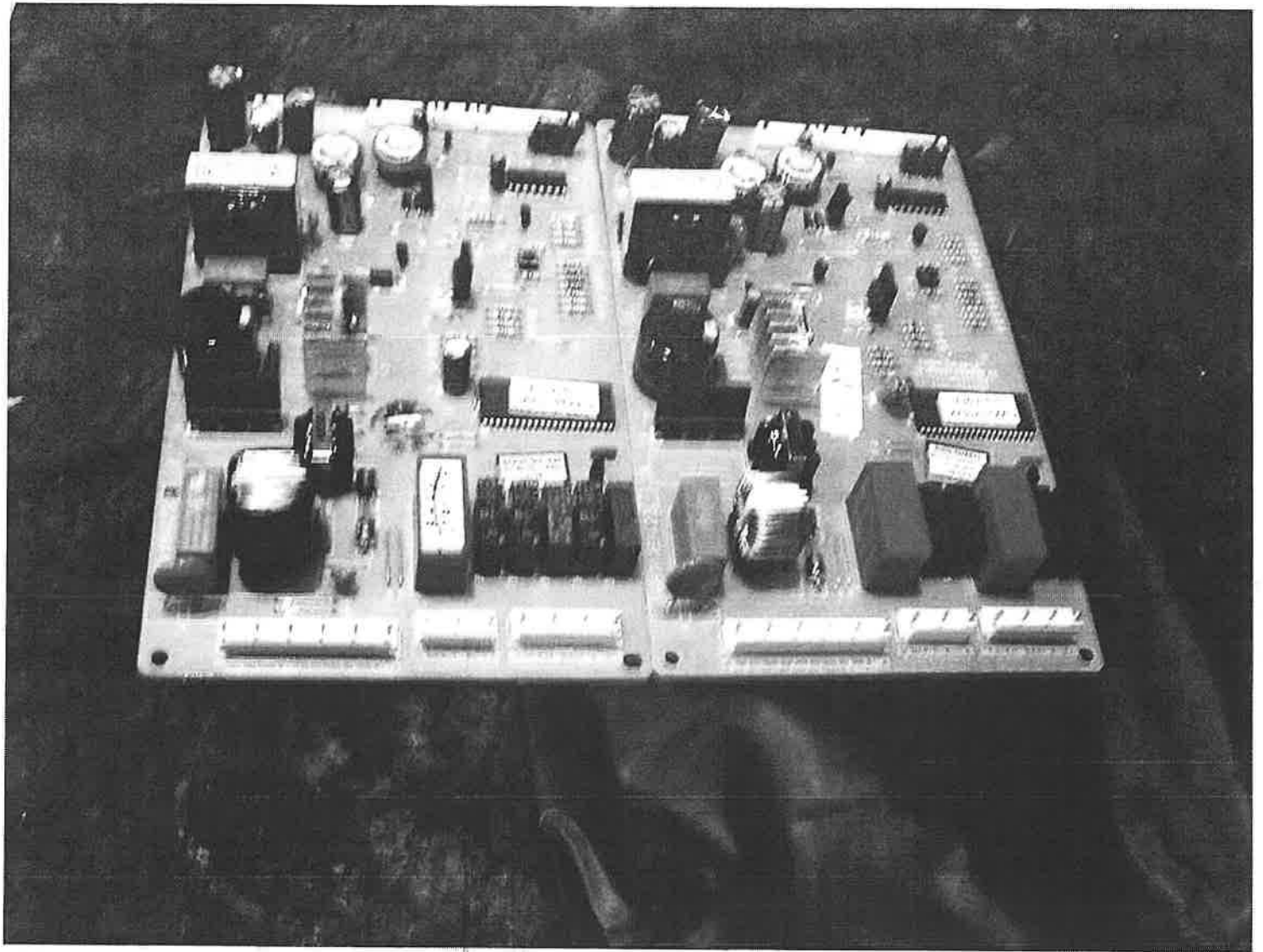
Date	Case and Court	Attorney Client	On Behalf Of
4/28/2008 Deposition	Religious and Charitable Risk Pooling Trust of the Brothers of the Christion Schools and Affiliates, a/s/o St. John's College High School v. Belkin International, Inc., et al. in the Superior Court of the District of Columbia (2007CA001112B)	Juliane C. Miller	Belkin International
11/19/2008 Deposition	Schwartz v. Invacare Corporation, et al. in the Superior Court of New Jersey, Bergen County (L-5819-06)	John E. Lamastra	Chubb Insurance a/s/o Martin Schwartz
6/25/2009 Trial	Schwartz v. Invacare Corporation, et al. in the Superior Court of New Jersey, Bergen County (L-5819-06)	John E. Lamastra	Chubb Insurance a/s/o Martin Schwartz
12/22/2010 Deposition	Richard J. Edwards v. Hi-Tech Electric, LLC, et al. in the Superior Court of the District of Columbia (2009CA006244B)	Julia Haller	Hi-Tech Electric
6/20/2011 Deposition	Charles Casey and Jeannette Casey v. The Geek Squad Subsidiary, Best Buy Stores, L.P. in the United States District Court for the District of Maryland (PWG-10-CV-2268)	Christopher R. Dunn	Best Buy
3/13/2012 Arbitration	James Hockenbury and Jennifer Hockenbury v. Friends of Paul's Run and PECO Energy and Square D Company in the Court of Common Pleas Philadelphia County (September 2009 term, No. 1333)	Peter A. Callahan	Friends of Paul's Run
3/14/2012 Deposition	Shipwright Harbor Marina, Inc. v. Victor Hastings, et al. in the Circuit Court for Anne Arundel County (C11-161850)	Ronald A. Baradel	Shipwright Harbor Marina
6/18/2014 Deposition	Allstate Insurance Company a/s/o Audoersch, et al. v. NVR, Inc. t/a NV Homes and/or Ryan Homes and Hilltop Electric Company in the Circuit Court for Baltimore County (03-C-13-003852, 53, and 55)	Edward W. Brady	Allstate Insurance a/s/o Audoersch, et al.
12/3/2014 Deposition	Cumberland Insurance Group a/s/o David Wickwire v. Delmarva Power in the Circuit Court for Dorchester County Maryland (09-C-13-020765)	Lisa C. McLaughlin	Delmarva Power
12/9/2014 Hearing	Catherine Hockenberry, Clinton L. Hockenberry v. William S. Ward III in Magisterial District Court 19-3-10, Dillsburg, Pennsylvania (MJ-19310-CV-0000170-2014)	Charles Young	Erie Insurance as carrier for William S. Ward III
5/5/2016 Deposition	Allstate Insurance Company a/s/o Stanley Nutt v. Washington Home Doctors, Inc. in the Circuit Court for Prince George's County (CAL15-18259)	Charles Fratus	Allstate Insurance a/s/o Stanley Nutt
5/17/2016 Deposition	HDI Gerling America Insurance Company v. Worth & Company, Inc. v. Malco Electric, Inc. in the United States District Court for the District of New Jersey (14-3614)	Lee Eckell	Worth & Company, Inc.

Flaherty Testimony, Cont. (Page 3)

Date	Case and Court	Attorney Client	On Behalf Of
3/1/2017 Deposition	Desheria Gaines v. 2 Smart Communications LLC in the Circuit Court of Maryland for Baltimore County (24-C-16-002216)	Dan Whitney	Desheria Gaines
4/5/2017 Deposition	Amica Mutual Insurance Company a/s/o Jerry Pfeffer, et al. v. Tuchers Air Conditioning & Heating, LLC in the Circuit Court for Montgomery County (423965-V)	Larissa Byers	Tuckers Air Conditioning & Heating, LLC
4/21/2017 Deposition	Eser Ozdeger, et al. v. A/R Electrical Solutions, Inc. in the Circuit Court for Montgomery County, Maryland (422731-V)	David Rubino	Macon Construction
7/6/2017 Trial	Desheria Gaines v. 2 Smart Communications LLC in the Circuit Court of Maryland for Baltimore County (24-C-16-002216)	Dan Whitney	Desheria Gaines
11/15/2017 Deposition	Sentinel Insurance Co., et al. v. Unilever United States, Inc., et al. and Quaj Enterprises Inc., et al. v. Unilever United States, Inc., et al. in the Superior Court for the District of Columbia (2015 CA 007536 B and 2016 CA 001808 B)	Gus Sara	Yonas, Inc. (one of the plaintiffs)
11/29/2017 Deposition	The Harford Mutual Ins. Co. v. Mona Electric Group in the Circuit Court for Maryland for Prince George's County (CAL17-07976)	Diane Moir	The Harford Mutual Ins. Co.
1/5/2018 Deposition	Todd Levine v. GBG, Inc. t/a Gold's Gym in the Circuit Court for Montgomery County, Maryland (419811-V)	Robert Ferguson	Gold's Gym
2/22/2018 Trial	Todd Levine v. GBG, Inc. t/a Gold's Gym in the Circuit Court for Montgomery County, Maryland (419811-V)	Robert Ferguson	Gold's Gym
6/26/2018 De Bene Esse Deposition	The Harford Mutual Ins. Co. v. Mona Electric Group in the Circuit Court for Maryland for Prince George's County (CAL17-07976)	Diane Moir	The Harford Mutual Ins. Co.
6/27/2018 Deposition	James Brown, et al. v. Hamilton Beach Brands, Inc. in the Circuit Court for Anne Arundel County (C-02-CV-17-003173)	Charles Fratus	Allstate Insurance (James Brown)
8/14/2018 Deposition	Nationwide Mutual Fire Insurance Company a/s/o Orest Lasuk v. Honeywell International, Inc., et al. in the Circuit Court for Anne Arundel County (C-02-CV-18-000017)	Kristen Dorsey	Nationwide (Lasuk)
10/24/2018 Trial	Harry Workman v. Axalta Coating Systems in the United States District Court for the Western District of Virginia (5:17cv00108)	James Liskow	Axalta Coating Systems
2/15/2019 Deposition	State Auto Property and Casualty Insurance Company v. Kim Eagan Woods in the United States District Court for the Middle District of Pennsylvania (Civil No. 4:17-02099-MWB)	Gary L. Weber	Kim Eagan Woods
6/11/2019 Deposition	Wright, et al. v. Ace Hardware Corp., et al. in the Circuit Court for Kent County Maryland (C-14-CV-17-000044)	Tamara B. Goorevitz	Ace Hardware

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Date	Case and Court	Attorney Client	On Behalf Of
9/13/2019 Deposition	XL Speciatly Insurance Co. v. Jeanneau America, Inc. et al. in the United States District Court for the District of Maryland (Civil Action No. 1:18-cv-2703)	Christopher M. Schierloh	XL Specialty Insurance
9/30/2020 Deposition	Greg Subiszak, et al: v. Aztec Motel and Marsden and Sons Electric in the Superior Court of New Jersey, Cape May County (L-000558-17)	Jared K. Levy	Aztec Motel
10/1/2020 Deposition	Robert Ritchie, Jr. v. Baltimore Gas and Electric Company and Middle River Station Development in the Circuit Court for Baltimore City (24-C-19-004533	Jason Foltin	BGE



RETAINED BY COUNSEL.

